

6th Science Lesson 1

1] Measurements

Do You Know?

On the moon where the gravitational force is less than that is on the earth, the weight will reduce but the mass will remain same. The moon's gravitational pull is one sixth of the earth's pull. Thus objects weigh six times lighter on the Moon than on the Earth.

In the earlier days, people used sand clock and sundial to measure the passage of time during day time. The shadow cast by a stick can be used to estimate time. A vessel having a small hole is filled with sand and it is used as a clock. The sand in the vessel is allowed to come down and it is used to estimate the time.

An odometer is a device used for indicating distance travelled by an automobile. The metric system or standard set of units was created by the French in 1790. A ruler or scale, used now-a-days to measure length, was invented by William Bedwell in the 16th century. A standard metre rod made of an alloy of platinum and iridium is placed at the Bureau of Weights and Measures in Paris. National Physical Laboratory in Delhi has a copy of this metre rod. One kilogram is equal to the mass of a certain bar of platinum-iridium alloy that has been kept at the International Bureau of Weights and Measures in Sevres, France since 1889.

Choose the correct answer:

1. The height of a tree can be measured by

- (a) Metre scale
- (b) Metre rod
- (c) Plastic ruler
- (d) Measuring tape

2. Conversion of 7 m into cm gives _____

- (a) 70 cm
- (b) 7 cm
- (c) 700 cm
- (d) 7000 cm

3. Quantity that can be measured is called _____

- (a) Physical quantity
- (b) measurement
- (c) unit
- (d) motion

4. Choose the correct one

- (a) $\text{km} > \text{mm} > \text{cm} > \text{m}$
- (b) $\text{km} > \text{mm} > \text{m} > \text{cm}$
- (c) $\text{km} > \text{m} > \text{cm} > \text{mm}$
- (d) $\text{km} > \text{cm} > \text{m} > \text{mm}$

5. While measuring the length of an object using a ruler, the position of your eye should be

(a) left side of the point.

(b) vertically above the point where the measurement is to be taken

(c) right side of the point

(d) any where according to one's convenience

Fill in the blanks:

1. SI unit of length is _____

2. 500 gm = _____ kilogram

3. The distance between Delhi and Chennai can be measured in _____

4. 1 m = _____ cm

5. 5 km = _____ m.

State True or False. If False, correct the statement.

1. We can say that mass of an object is 126 kg.

2. Length of one's chest can be measured using metre scale

3. Ten millimetre makes one centimetre.

4. A hand span is a reliable measure of length.

5. The SI system of units is accepted everywhere in the world.

Complete the analogy:

1. Sugar: Beam Balance: Lime Juice: _____?

2. Height of a person: cm :: Length of your sharpened pencil lead : _____?

3. Milk: Volume :: Vegetables: _____?

Match the following:

1. Length of the fore arm a. metre

2. SI unit of length b. second

3. Nano c. 10^3

4. SI unit of time d. 10^{-9}

5. Kilo e. Cubit

Arrange the following in the increasing order of unit.

1. Metre, 1 centimetre, 1 kilometre, and 1 millimetre.

Find the answer for the following questions within the grid.

1. 10^{-3} is one _____

2. SI unit of time is _____

3. Cross view of reading a measurement leads to _____

4. _____ is the one what a clock reads.

5. _____ is the amount of substance present in an object.
6. _____ can be taken to get the final reading of the recordings of different students for a single measurement.
7. _____ is a fundamental quantity.
8. _____ shows the distance covered by an automobile.
9. A tailor uses _____ to take measurements to stitch the cloth.
10. Liquids are measured with this physical quantity.

Answers:**Choose the correct answer:**

1. Measuring Tape 2. 700cm 3. Physical quantity 4. km > m > cm > mm
5. Vertically above the point where the measurement is to be taken.

Fill in the blanks:

1. Meter 2. 0.5kilogram 3. Kilometre 4. 100cm 5. 5000m

State True or False:

1. True
2. False

Correct Statement: Length of one's chest can be measured using measuring tape.

3. True
4. False

Correct Statement: Hand span and cubit are not particular measurements as it varies from person to person.

5. True

Complete the Analogy:

1. Measuring Jar 2. mm 3. Mass

Match the following

1. Cubit 2. Metre 3. 10^{-9} 4. Second 5. 10^3

Arrange the following in the increasing order of unit:

1 millimetre, 1 centimetre, 1 meter, 1 kilometre

Find the answers for the following questions within the grid:

1. Millimetre 2. Second 3. Error 4. Time 5. Mass 6. Average 7. Length 8. Odometer 9. Tape 10. Litre

6th Science Lesson 2

2] Force and Motion

Do you know?

Aryabhatta, an ancient Indian astronomer, said, "As the banks of the river appear to move back to a person in a boat floating gently in a river, the night sky studded with stars appear to move from the east to the west and so the Earth rotates from the west to the east."

Forces are push or pull by an animate or inanimate agency.

Oscillations at Greater Speed: Ask your friend to hold the two ends of a stretched rubber band. Strike it in the middle. Do you see that it oscillates very fast? When the oscillation is very swift, it is called as vibration. Fast oscillations are referred to as vibrations.

All oscillatory motions are periodic, but not all periodic motions are oscillatory motion.

The distance travelled by an object in unit time is called speed of the object. If an object travelled a distance "d" in time "t" then, its speed is given as:

$$\text{Speed (s)} = \text{Distance travelled} / \text{Time taken} = d / t$$

Usain Bolt crossed 100 metre in 9.58 seconds and made a world record. If you are able to run faster than him, then Olympic Gold Medal is waiting for you.

A Cheetah is the fastest land animal running at a speed of 112 km/h.

Choose the correct answer:

1. Unit of Speed is

- (a) m
- (b) s
- (c) kg
- (d) m/s

2. Which among the following is an oscillatory motion?

- (a) Rotation of the earth about its axis.
- (b) Revolution of the moon about the earth.
- (c) To and fro movement of a vibrating string.
- (d) All of these

3. The correct relation among the following is

- (a) Speed = Distance x Time
- (b) Speed = Distance / Time
- (c) Speed = Time / Distance
- (d) Speed = 1 / (Distance x Time)

4. Gita travels with her father in a bike to her uncle's house which is 40 km away from her home. She takes 40 minutes to reach there

Statement 1: She travels at a speed of 1 Km / minute.

Statement 2: She travels at a speed of 1 km/hour.

- (a) Statement 1 alone is correct.
- (b) Statement 2 alone is correct.
- (c) Both statements are correct
- (d) Neither statement 1 nor statement 2 is correct.

Fill in the blanks:

- 1. A bike moving on a straight road is an example for _____ motion.
- 2. Gravitational force is a _____ force.
- 3. Motion of a potter's wheel is an example for _____ motion.
- 4. When an object covers equal distances in equal interval of time, it is said to be in _____ motion.

State true or false. If false, correct the statement:

- 1. To and fro motion is called oscillatory motion.
- 2. Vibratory motion and rotatory motion are periodic motions.
- 3. Vehicles moving with varying speeds are said to be in uniform motion.
- 4. Robots will replace human in future.

Match the following:



1. a. Circular motion



2. b. Oscillatory motion



3. c. Linear motion



4. d. Rotatory motion



5. e. Linear and rotator motion

Given below is the distance-travelled by an elephant across a forest with uniform speed. Complete the data of the table given below with the idea of uniform speed:

Distance (m)	0	4		12		20
Time (s)	0	2	4		8	10

Complete the analogy:

1. Kicking a ball : Contact force :: Falling of leaf : _____?
2. Distance : metre :: Speed : _____?
3. Circulatory motion : A spinning top :: Oscillatory motion : _____?

Complete the web chart:

Non-periodic		
	Movement repeated after a fixed interval of time	Movement about an axis or a fixed centre

Answer in a word or two:

1. The force which acts on an object without physical contact. _____
2. A change in the position of an object with time. _____
3. The motion which repeats itself after a fixed interval of time. _____
4. The motion of an object which covers equal distances in equal intervals of time. _____
5. A machine capable of carrying out a complex series of actions automatically. _____

Answers:

Choose the correct answers:

1. s
2. To and fro movement of a vibrational string
3. Speed = Distance / Time
4. Statement 1 alone is correct

Fill in the blanks:

1. Linear
2. Non-contact force
3. Rotatory
4. Uniform

State True or False:

1. True
2. False

Correct Statement: Vibratory motion and Oscillatory motion are periodic motions.

3. False

Correct Statement: Vehicles moving with varying speed are said to be in non-uniform motion.

4. False

Correct Statement: Robots cannot replace human in future.

Match the following:

1. Linear motion
2. Rotatory motion
3. Oscillatory motion
4. Circular motion
5. Linear and Rotator motion

Given below is the distance-travelled by an elephant across a forest with uniform speed. Complete the data of the table given below with the idea of uniform speed:

Distance (m)	0	4	8	12	16	20
Time (s)	0	2	4	6	8	10

Complete the Analogy:

1. Non-contact force 2. Meter/second 3. Swinging of a pendulum

Complete the web chart:

Non-periodic	Periodic motion	Rotational motion
Movement not repeated in a uniform interval	Movement repeated after a fixed interval of time	Movement about an axis or a fixed centre

Answer in a word or two:

1. Non-contact force 2. Motion 3. Oscillatory motion 4. Uniform motion

5. Robots

6th Science Lesson 3

3] Matter Around Us

Do You Know?

Solid → Liquid → Gas

'Liquefaction of gases' is the process by which substances in their gaseous state are converted to the liquid state. When the pressure on a gas is increased, its molecules come closer together, and the temperature is reduced. This removes enough energy to make it change from the gaseous state to the liquid state.

A mixture is an impure substance and contains more than one kind of particles. In the mixture the components are mixed in any proportion.

In washing machines water is squeezed out from clothes and they are dried. This method is called centrifugation.

Rice husk also called chaff is the hard coating or protective covering on a seed or grains. It protects the seed during the growing season. Husk can be used as building material, fertilizer, insulation material and fuel.

Combination of methods are used sometimes for complete separation. If the mixture of sand and salt in water has to be separated several methods like sedimentation, decantation, filtration, evaporation and condensation are used.

In most houses people use commercial water filter to remove not only the impurities but also to kill the harmful germs in water using UV rays. Reverse Osmosis (RO) is a process of removing impurities from water to make it potable.

Choose the correct answer:

1. _____ is not made of matter.

(a) Gold ring

(b) Iron nail

(c) Light ray

(d) Oil drop

2. 200 ml of water is poured into a bowl of 400 ml capacity. The volume of water will be _____

(a) 400 ml

(b) 600 ml

(c) 200 ml

(d) 800 ml

3. Seeds from water-melon can be removed by _____

(a) hand-picking

(b) filtration

(c) magnetic separation

(d) decantation

4. Lighter impurities like dust when mixed with rice or pulses can be removed by _____

(a) Filtration

(b) sedimentation

(c) decantation

(d) winnowing

5. _____ is essential to perform winnowing activity.

(a) Rain

(b) Soil

(c) Water

(d) Air

6. Filtration method is effective in separating _____ mixture.

(a) solid-solid

(b) solid-liquid

(c) liquid-liquid

(d) liquid-gas

7. Among the following _____ is not a mixture.

(a) Coffee with milk

(b) lemon juice

(c) Water

(d) ice cream embedded with nuts

Fill in the blanks:

1. Matter is made up of _____
2. In solids, the space between the particles is less than in _____
3. Grains can be separated from their stalks by _____
4. Chillies are removed from 'Upma' by _____ method.
5. The method employed to separate clay particles from water is _____
6. Water obtained from tube wells is usually _____ water.
7. Which among the following _____ will get attracted to by magnet? (safety pins, pencil and rubber band)

State true or false. If false, correct the statement:

1. Air is not compressible.
2. Liquids have no fixed volume but have fixed shape.
3. Particles in solids are free to move.
4. When pulses are washed with water before cooking, water is separated from them by filtration.
5. Strainer is a kind of sieve which is used to separate a liquid from solid.
6. Grain and husk can be separated by winnowing.
7. Air is a pure substance.
8. Butter from curd is separated by sedimentation.

Complete the given analogy.

1. Solid: Rigidity: Gas : _____
2. Large Inter-particle space: Gas :: _____: Solid.
3. Solid: Definite shape :: _____: shape of the vessel.
4. Husk-grains: winnowing :: sawdust –chalk piece: _____
5. Murukku from hot oil : _____: coffee powder residue from decoction : _____
6. Iron-sulphur mixture: _____ :: Mustard seeds from Urad-dhal : rolling

Match the following:

Property	Example
Breaks easily (brittle)	Metal pan
Bends readily	Rubber band
Can be stretched easily	Cotton wool
Gets compressed easily	Mud pot
Gets heated readily	Plastic wire

A	B	C
1) Separation of visible undesirable components	a) Water mixed with chalk powder	i) Magnetic separation
2) Separation of heavier and lighter components	b) Sand and water	ii) Decantation
3) Separation of insoluble impurities	c) Iron impurities	iii) Filtration
4) Separation of magnetic components from non-magnetic components	d) Rice and stone	iv) Hand-picking
5) Separation of solids from liquids	e) Husk and paddy	v) Winnowing

Answers:**Choose the appropriate answers:**

1. Light ray 2. 200 ml 3. Hand picking 4. Winnowing 5. Air 6. Solid-liquid 7. Water

Fill in the blanks:

1. Atoms 2. Liquid and Gases 3. Threshing 4. Hand picking 5. Filtration 6. Impure 7. Safety pins

State True or False:

1. False

Correct statement: Air is highly compressible.

2. False

Correct Statement: Liquid has fixed volume but have no fixed shape.

3. False

Correct Statement: Particles of solid cannot move freely.

4. False

Correct Statement: When pulses are washed with water before cooking water is separated from by the process of decantation.

5. True

6. True

7. False

Correct Statement: Air is a mixture of gas.

8. False

Correct Statement: Butter from curd is separated by churning.

Complete the given Analogy:

1. Flexibility 2. Little inter-particle space 3. Liquid 4. Filtration

5. Filtration and Filtration 6. Magnetic separation

Match the Following:

1. Mud pot 2. Plastic wire 3. Rubber band 4. Cotton wool 5. Metal pan

1. Separation of visible undesirable components – Rice and stone – Hand-picking
2. Separation of heavier and lighter components- Husk and Paddy- Winnowing
3. Separation of insoluble impurities – Water mixed with chalk powder- Filtration
4. Separation of magnetic components from non-magnetic components – Iron impurities- Magnetic separation
5. Separation of solids from liquids – Sand and water - Decantation

6th Science Lesson 4

4] The World of Plants

Do you know?

The leaves of Victoria amazonica plant grows upto 3 metres across. A mature Victoria leaf can support an evenly distributed load of 45 Kilograms or apparently young person

Nile is the longest river in the world. It is 6650 km long. The longest river in India is Ganges. It is 2525 km long.

Air spaces in stems and petioles of lotus are useful for floating in water.

The first land plant appeared around 470 million years ago. They were mosses and liverworts. The Amazon Rain Forest in South America produces half of the world's oxygen supply.

Thar Desert, also called Great Indian Desert, is an arid region of rolling sand hills on the Indian subcontinent. It is located partly in Rajasthan state, north-western India, and partly in Punjab and Sindh (Sind) Provinces, Eastern Pakistan.

World habitat day is observed on 1st Monday of October every year.

Bamboo is one of the fast growing plants, during active growth phase.

Choose the correct answer:

1. Pond is an example of _____ ecosystem.

- (a) Marine
- (b) freshwater
- (c) deserts
- (d) mountain

2. The important function of stomata is _____

- (a) Conduction
- (b) transpiration
- (c) photosynthesis
- (d) absorption

3. Organ of absorption is _____

- (a) Root
- (b) stem
- (c) leaf
- (d) flower

4. The habitat of water hyacinth is

- (a) Aquatic
- (b) terrestrial
- (c) desert
- (d) mountain

Fill in the blanks:

1. Earth's surface is covered by _____ % of water
2. The driest places on the Earth are _____
3. Fixation and absorption are the main functions of _____
4. Primary organs of photosynthesis are _____
5. Taproot system is present in _____ plants.

State True or False. If false, correct the statement.

1. Plants can live without water.
2. All plants have chlorophyll.
3. Plants have three parts: the root, the stem and leaves.
4. Mountain is an example for freshwater habitat.
5. Root is modified into spines.
6. Green plants need sunlight.

Match the following:

1. Mountain a. Monocot
2. Desert b. Branches
3. Stem c. Dry place
4. Photosynthesis d. Himalayas
5. Fibrous root e. leaves

Arrange the following in correct sequence.

1. Leaf – Stem – Root – Flower
2. Transpiration – Conduction – Absorption – Fixation

Answers:

Choose the correct answer:

1. Freshwater 2. Transpiration 3. Root 4. Aquatic

Fill in the blanks:

1. More than 70% 2. Deserts 3. Root 4. Leaves 5. Dicotyledonous

Say True or False:

1. False

Correct Statement: Plants cannot live without water.

2. True

3. False

Correct Statement: Plant have several parts such as the root, stem, leaves, flowers, fruits and seeds.

4. False

Correct Statement: Rivers, Ponds, lakes and pools are the example for freshwater habitat. Mountains are example for the Terrestrial habitat.

5. False

Correct Statement: Leaves are modified into spines.

6. True

Match the following:

1. Himalayas 2. Dry place 3. Branches 4. Leaves 5. Monocot

Arrange the following in correct sequence.

1. Root- Stem- Leaf- Flower

2. Fixation- Absorption- Conduction- Transpiration

6th Science Lesson 5**5] The World of Animals****Do you know?**

In Jurong Birds Park, Singapore, Penguins are kept in a big glass case with ice bergs and the temperature is maintained at 0° C and below.

Animals change their location as the season changes. It is called migration. In Tamil Nadu bird sanctuaries are located at Vedanthangal, Kodiyakkarai and Koondhankulam. Many birds from foreign countries like Siberia and Russia migrate to Vedanthaangal. Likewise, during summer and drought conditions birds from our country migrate to foreign countries. These birds are called migratory birds.

Spending winters in a dormant condition is called hibernation (Winter sleep). Eg. Turtle. On the other hand, spending the hot and dry period in an inactive state is known as aestivation (Summer sleep). Eg. Snail

Kangaroo rat does not drink water at all. It obtains the required water from the seed it eats.

The mountain goat namely Nilgiri Tahr can find small spaces on rock to climb with ease and keep its balance as it feeds.

Choose the correct answer:

1. The study of living beings or organisms is called.

- (a) Psychology
- (b) Biology
- (c) Zoology
- (d) Botany

2. Which of the following are the characteristics of living beings?

(i) Respiration (ii) Reproduction (iii) Adaptation (iv) Excretion

Choose the correct one

- (a) (i), (ii) and (iv) only
- (b) (i), (ii) only
- (c) (ii) and (iv) only
- (d) (i), (iv), (ii) and (iii)

3. Lizards breathe through their

- (a) skin
- (b) gills
- (c) lungs
- (d) trachea

4. All animals need

- (a) food and water only
- (b) water only
- (c) air, food and water
- (d) food only

5. Which animal has the special organs of breathing called gills?

- (a) Earthworm
- (b) fox
- (c) fish
- (d) Frog

6. Choose the set that represents only biotic components of a habitat.

- (a) Tiger, Deer, Grass, Soil
- (b) Rocks, Soil, Plants, Air
- (c) Sand, Turtle, Crab, Rocks
- (d) Aquatic plants, Fish, Frog, Insects

7. Which of the following cannot be called as a habitat?

- (a) A desert with camels
- (b) A pond with fish and snails
- (c) Cultivated land with grazing cattle
- (d) A jungle with wild animals

8. Birds fly in the air with the help of

- (a) Heavy and strong bones
- (b) Soft and thick bones
- (c) Hollow and light bones
- (d) flat and thick bones

9. Paramecium moves from one place to other with the help of _____

- (a) Pseudopodia
- (b) flagella
- (c) foot
- (d) cilia

10. Kangaroo rat lives in

- (a) Aquatic habitat
- (b) desert habitat
- (c) Grass land habitat
- (d) mountain habitat

Fill in the blanks:

- 1. Water bodies, deserts, mountains are called _____
- 2. Based on the number of cells present animals are classified into _____ and _____
- 3. Tail of a bird acts as a rudder which helps to _____
- 4. Amoeba moves with the help of _____

State True or False. If false, write the correct statement.

- 1. Habitat is a living or dwelling place of an organism.
- 2. The geographical features and environmental conditions on earth remain same from one place to other.
- 3. Amoeba is a unicellular organism and it moves with pseudopodia.
- 4. Birds can see only one object at a time.
- 5. Paramecium is a multi-cellular organism.

Complete the following:

- 1. Tropical rain forests, grasslands and deserts are known as _____

2. Some living things are made of a single cell, called _____ organism.
3. The breathing organ of a fish is known as _____
4. The lizard _____ on the ground with its claw on its feet.
5. Camel stores _____ in its hump.

Answers:**Choose the correct answers:**

1. Biology 2. i, ii iv and iii 3. Lungs 4. Air, food and water 5. Fish 6. Aquatic plants, Fish, Frog, Insects
7. Cultivated land with grazing cattle 8. Hollow and light bones 9. Cilia 10. Desert Habitat

Fill in the blanks:

1. Habitats 2. Unicellular and Multicellular 3. Control the direction of movements 4. Pseudopodia (False foot)

Say True or False:

1. True
2. False

Correct Statement: The Geographical features and environmental conditions on earth vary from one place to other.

3. True
4. False

Correct Statement: Birds have binocular vision; it can see two objects at a time.

5. False

Correct Statement: Paramecium is a unicellular organism.

Complete the following:

1. Habitats 2. Unicellular 3. Gills 4. Moves 5. Fat

6th Science Lesson 6**6] Health and Hygiene****Do You Know?**

Soyabean is the highly rich source of protein.

Gooseberries contains nearly 20 times Vitamin C than Orange.

Sun screen lotion reduces your skin's ability to produce vitamin D by upto 95% which may lead to vitamin D deficiency.

80% of the Moringa leaves in the world are produced in India. The major countries which import Moringa leaves are China, US, Germany, Canada, South Korea and European countries.

India has the second largest number of obese children in the world after China. According to a study it has been found that 14.4 million children in the country have excess weight.

Disease: Disease is a definite pathological process having a characteristic set of signs and symptoms.

Disorder: Disorder is a derangement or abnormality in function.

A Virus that contains R.N.A. instead of D.N.A is called a Retrovirus.

Choose the correct answer:

1. Our body needs _____ for muscle building.

(a) Carbohydrate

(b) fat

(c) Protein

(d) water

2. Scurvy is caused due to the deficiency of _____

(a) Vitamin A

(b) Vitamin B

(c) Vitamin C

(d) Vitamin D

3. Calcium is an example for

(a) Carbohydrate

(b) fat

(c) protein

(d) minerals

4. Bacteria are very small _____ microorganism.

(a) Prokaryotic

(b) eukaryotic

(c) protozoa

(d) acellular

5. We should include fruits and vegetables in our diet, because _____

(a) They are the best source of carbohydrates

(b) they are the best source of proteins

(c) They are rich in minerals and Vitamins

(d) they have high water content

State True or False. If false, write the correct statement.

1. There are three main nutrients present in food.

2. Fats are stored as energy by our body.

3. All bacteria have flagella.

4. Iron helps in the formation of haemoglobin.

5. Virus can grow and multiply outside host.

Fill in the blanks:

1. Malnutrition leads to _____

2. Iodine deficiency leads to _____ in adults.

3. Vitamin D deficiency causes _____

4. Typhoid is transmitted due to contamination of _____ and water.

5. Influenza is a _____ disease.

Complete the analogy:

1. Rice: Carbohydrate :: Pulses : _____

2. Vitamin D: Rickets :: Vitamin C : _____

3. Iodine: Goitre :: Iron: _____

4. Cholera: Bacteria :: Smallpox : _____

Match the following:

1. Vitamin A - a. Rickets

2. Vitamin B - b. Night blindness

3. Vitamin C - c. Sterility

4. Vitamin D - d. Beri beri

5. Vitamin E - e. Scurvy

Answers:

Choose the correct answer:

1. Protein 2. Vitamin C 3. Minerals 4. Prokaryotic 5. They are rich in minerals and vitamins

State True or False:

1. False

Correct Statement: There are six main nutrients present in the food.

2. True

3. False

Correct Statement: Not all the bacteria's have flagella. Only some bacteria's have flagella.

4. True

5. False

Correct Statement: Virus grow and multiply inside the host.

Fill in the blanks:

1. Deficiency diseases 2. Goitre 3. Rickets 4. Food 5. Viral(virus)

Complete the analogy:

1. Proteins 2. Scurvy 3. Anaemia 4. Virus

Match the Following:

1. Night blindness 2. Beri beri 3. Scurvy 4. Rickets 5. Sterility

6th Science Lesson 7**7] Computer – An introduction****Do you know?**

ENIAC (Electronic Numerical Integrator and Computer) was the first computer introduced in the year 1946. This is the first General purpose Computer.

Choose the correct answer:

1. Who is the father of computer?

- (a) Martin Luther King
- (b) Graham Bell
- (c) Charlie Chaplin
- (d) Charles Babbage

2. Which of the following is another form of computer?

- (a) Blackboard
- (b) Mobile
- (c) Radio
- (d) Book

3. When was the first computer introduced?

- (a) 1980
- (b) 1947
- (c) 1946
- (d) 1985

4. Who is the computer's first programmer?

- (a) Lady Wellington
- (b) Augusta ado Lovelace
- (c) Mary Curie
- (d) Mary Comb

5. Pick out the odd one:

- (a) Calculator

(b) Abacus

(c) Flash card

(d) Laptop

Fill in the blanks:

1. Data is _____ information.
2. World's first general purpose computer is _____
3. Information is _____ data.
4. Fifth generation computer has _____ intelligence.
5. _____ is the device that uses Index number.

State true or false:

1. Computer is an electronic device.
2. Sir Isaac Newton invented computer.
3. Computer can do calculations fast.

Match the following:

1. First generation computer - Artificial Intelligence
2. Second generation computer - Integrated Circuit
3. Third generation computer - Vacuum tubes
4. Fourth generation computer - Transistor
5. Fifth generation computer - Micro processor

Answers:

Choose the correct answers:

1. Charles Babbage 2. Mobile 3. 1946 4. Augusta ada Lovelace 5. Flash card

Fill in the Blanks:

1. Unprocessed 2. Abacus 3. Processed 4. Artificial 5. Analog Computer

State True or False:

1. True
2. False

Correct Statement: Charles Babbage invented the Computer.

3. True

Match the Following:

1. Vacuum tubes 2. Transistor 3. Integrated circuits 4. Microprocessor 5. Artificial Intelligence

6th Science Lesson 8

8] Heat

Do You Know?

One day in 1922, the air temperature was measured at 59°C in the shade in Libya, Africa. The coldest temperature in the world was measured in the Antarctic continent. It was approximately -89°C. The minus sign (-) is used when the temperature falls below the freezing point of water, which is 0°C. If water becomes ice at 0°C, you can imagine how cold -89°C would be. Our normal body temperature is 37°C. Our body feels cool if the air temperature is around 15 to 20 degree Celsius.

Glassware used in kitchen and laboratory are generally made up of Borosilicate glass (pyrex glass). The reason is that the Borosilicate glasses do not expand much on being heated and therefore they do not crack.

Choose the best answers:

1. When an object is heated, the molecules that makes up the object
 - (a) Begin to move faster
 - (b) Lose energy
 - (c) Become heavier
 - (d) Become lighter
2. The unit of heat is
 - (a) Newton
 - (b) Joule
 - (c) Volt
 - (d) Celsius
3. One litre of water at 30°C is mixed with one litre of water at 50°C. The temperature of the mixture will be
 - (a) 80°C
 - (b) More than 50°C but less than 80°C
 - (c) 20°C
 - (d) Around 40°C
4. An iron ball at 50°C is dropped in a mug containing water at 50°C. The heat will
 - (a) Flow from iron ball to water
 - (b) Not flow from iron ball to water or from water to iron ball
 - (c) Flow from water to iron ball
 - (d) Increase the temperature of both

Fill in the blanks:

1. Heat flows from a _____ body to a _____ body.
2. The hotness of the object is determined by its _____
3. The SI unit of temperature is _____
4. Solids _____ on heating and _____ on cooling.
5. Two bodies are said to be in the state of thermal _____ if there is no transfer of heat taking place.

State true or false. If false, correct the statement:

1. Heat is a kind of energy that flows from a hot body to a cold body.
2. Steam is formed when heat is released from water.
3. Thermal expansion is always a nuisance.
4. Borosilicate glass does not expand much on being heated.
5. The unit of heat and temperature are the same.

Match the following:

1. Heat - 0°C
2. Temperature - 100°C
3. Thermal Equilibrium - Kelvin
4. Ice cube - No heat flow
5. Boiling water - Joule

Complete the analogy:

1. Heat: Joule :: Temperature: _____
2. Ice cube: 0°C :: Boiling water: _____
3. Total Kinetic Energy of molecules: Heat :: Average Kinetic Energy: _____

Answers:**Choose the best answers:**

1. Begin to move faster
2. Joule
3. Around 40°C
4. Not flow from iron ball to water or from water to iron ball

Fill in the blanks:

1. Hot, Cold
2. Kinetic energy
3. Kelvin
4. Expand, Contract
5. Equilibrium

Say True or False:

1. True
2. False

Correct Statement: Ice is formed when heat is released from water.

3. True

4. True

5. False

Correct Statement: The SI unit of heat is joule. The SI unit of temperature is Kelvin.

Match the following:

1. Joule 2. Kelvin 3. No heat flow 4. 0°C 5. 100°C

Complete the analogy:

1. Kelvin 2. 100 °C 3. Average heat

6th Science Lesson 9

9] Electricity

Do You Know?

Warning: All experiments with electricity should only be performed with batteries used in a torch or radio. Do not, under any circumstance, make the mistake of performing these experiments with the electricity supply in your home, farm or school. Playing with the household electric supply will be extremely dangerous.

Electric Eel is a kind of fish which is able to produce electric current. This fish can produce an electric shock to safeguard itself from enemies and also to catch its food.

Ammeter is an instrument used in electric circuits to find the quantity of current flowing through the circuit. This is to be connected in series.

Thomas Alva Edison (February 11, 1847 – October 18, 1931) was an American inventor. He invented more than 1000 useful inventions and most of them are electrical appliances used in homes. He is remembered for the invention of electric bulb.

Choose the best answers:

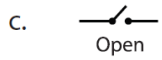
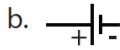
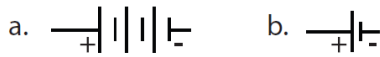
1. The device which converts chemical energy into electrical energy is

- (a) Fan
- (b) Solar cell
- (c) Cell
- (d) Television

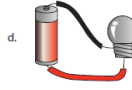
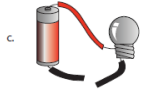
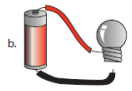
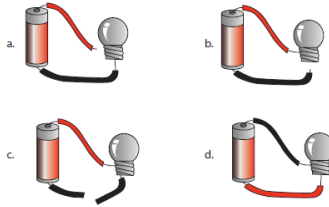
2. Electricity is produced in

- (a) Transformer
- (b) Power station
- (c) Electric wire
- (d) Television

3. Choose the symbol for battery



4. In which among the following circuits does the bulb glow?



5. _____ is a good conductor.

- (a) Silver
- (b) Wood
- (c) Rubber
- (d) Plastic

Fill in the blanks:

1. _____ are the materials which allow electric current to pass through them.
2. Flow of electricity through a closed circuit is _____
3. _____ is the device used to close or open an electric circuit.
4. The long perpendicular line in the electrical symbol represents its _____ terminal.
5. The combination of two or more cells is called a _____

State true or false. If false, correct the statement:

1. In a parallel circuit, the electricity has more than one path.
2. To make a battery of two cells the negative terminal of one cell is connected to the negative terminal of the other cell.
3. The switch is used to close or open an electric circuit.
4. Pure water is a good conductor of electricity.
5. Secondary cell can be used only once.

Match the following:

sl.no.	Symbol	Description
1		open key
2		cell
3		bulb glows
4		battery
5		bulb does not glow

Arrange in sequence:

A cell, a device, electrical energy, is called, into, chemical energy, that converts.

Consider the statements given below and choose the correct option:

1. Assertion (A) : It is very easy for our body to receive electric shock.

Reason (R) : Human body is a good conductor of electricity.

(a) Both A and R is correct and R is the correct explanation for A

(b) A is correct, but R is not the correct explanation for A

(c) A is wrong but R is correct

(d) Both A and R is correct and R is not the correct explanation for A.

Answers:**Choose the best answers:**

1. Cell 2. Power station 3.  4.  5. Silver

Fill in the blanks:

1. Conductors 2. Current 3. Switch 4. Positive 5. Battery

Say True or False:

1. True

2. False

Correct Statement: To make a battery of two cells the negative terminal of one cell is connected to the positive terminal of the other cell.

3. True

4. False

Correct Statement: Pure water is a bad conductor of electricity.

5. False

Correct Statement: Secondary cells can be recharged and used again and again.

Match the following:

1. Cell 2. Bulb does not glow 3. Open key 4. Bulb glows 5. Battery

Arrange in sequence:

A device that converts chemical energy into electrical energy is called a Cell.

Consider the statements given below and choose the correct option:

1. Both A and R is correct and R is the correct explanation for A

6th Science Lesson 10**10] Changes Around Us****Do You Know?**

The change of state from solid to gas directly is called sublimation. Ex: Camphor

Water is known as the universal solvent. It dissolves a wide range of substance.

Choose the best answers:

1. When ice melts to form water, change occurs in its

- (a) Position
- (b) Colour
- (c) State
- (d) Composition

2. Drying of wet clothes in air is an example of

- (a) Chemical change
- (b) Undesirable change
- (c) Irreversible change
- (d) Physical change

3. Formation of curd from milk is

- (a) A reversible change
- (b) A fast change
- (c) An irreversible change
- (d) An undesirable change

4. Out of the following an example of a desirable change is

- (a) Rusting

(b) Change of seasons

(c) Earthquake

(d) Flooding

5. Air pollution leading to Acid rain is a

(a) Reversible change

(b) Fast change

(c) Natural change

(d) Human made change

Fill in the blanks:

1. Magnet attracts iron needle. This is _____ change. (a reversible / an irreversible)

2. Boiling of egg results in _____ change. (a reversible / an irreversible)

3. Changes that are harmful to us are _____ (desirable / undesirable)

4. Plants convert Carbon-di-oxide and water into starch. This is an example of _____ change. (natural / human made)

5. Bursting of fire crackers is a _____ change whereas germination of seeds is a _____ change. (slow / fast)

State true or false. If false, correct the statement:

1. Growing of teeth in an infant is slow change.

2. Burning of match stick is a reversible change.

3. Change of New moon to Full moon is human made.

4. Digestion of food is a physical change.

5. In a solution of salt in water, water is the solute.

Complete the analogy:

1. Curdling of milk: irreversible change :: Formation of clouds: _____ change

2. Photosynthesis: _____ change :: burning of coal: Human – made change

3. Dissolving of glucose: reversible change :: Digestion of food: _____ change

4. Cooking of food: desirable change :: decaying of food: _____ change

5. Burning of matchstick: _____ change :: Rotation of the Earth: Slow change

Circle the odd one out. Give reason for your choice:

1. Growth of a child, Blinking of eye, Rusting, Germination of a seed

2. Glowing of a bulb, lighting of a candle, breaking of a coffee mug, curdling of milk

3. Rotting of an egg, condensation of water vapour, trimming of hair, ripening of fruit

4. Inflating a balloon, popping a balloon, fading of wall paint, burning of kerosene

Answers:

Choose the best answer:

1. State 2. Physical change 3. An irreversible change 4. Change of seasons 5. Human made change

Fill in the blanks:

1. A reversible change 2. An irreversible 3. Undesirable 4. Natural 5. Fast, Slow

Say True or False:

1. True

2. False

Correct Statement: Burning of matchstick is an irreversible chemical change.

3. False

Correct Statement: Change of New moon to Full moon is a natural change.

4. False

Correct Statement: The digested food undergoes chemical change.

5. False

Correct Statement: In a solution of salt in water, water is the solvent.

Complete the analogy:

1. Reversible change 2. Natural 3. Irreversible change 4. Undesirable change 5. Fast

Circle the odd one out. Give reason for your choice:

1. Blinking of eye. All the others are slow changes

2. Curdling of milk. All the others are fast changes.

3. Trimming of hair. All the others are slow changes.

4. Fading of wall paint. All the others are fast changes.

6th Science Lesson 11

11] Air

Do You Know?

A weathercock shows the direction in which the air is moving at a particular place. You can also make a wind sock to find the direction of the wind. Can you try it yourself?

When carbon-di-oxide is cooled to -57°C , it directly becomes a solid, without changing to its liquid state. It is called dry ice and is a good refrigerating agent. Dry ice is used in trucks or freight cars for refrigerating perishable items such as meat and fish while transporting them.

Choose the best answers:

1. _____ is the percentage of nitrogen in air.

(a) 78%

(b) 21%

(c) 0.03%

(d) 1%

2. Gas exchange takes place in plants using _____

(a) Stomata

(b) Chlorophyll

(c) Leaves

(d) Flowers

3. The constituent of air that supports combustion is _____

(a) Nitrogen

(b) Carbon-di-oxide

(c) Oxygen

(d) Water vapour

4. Nitrogen is used in the food packaging industry because it _____

(a) Provides colour to the food

(b) Provides oxygen to the food

(c) Adds proteins and minerals to the food

(d) Keeps the food fresh

5. _____ and _____ are the two gases, which when taken together make up about 99 percentage of air.

I. Nitrogen II. Carbon-di-oxide III. Noble gases IV. Oxygen

(a) I and II

(b) I and III

(c) II and IV

(d) I and IV

Fill in the blanks:

1. _____ is the active component of air.
2. The gas given out during photosynthesis is _____
3. _____ gas is given to the patients having breathing problems.
4. _____ can be seen moving in a beam of sunlight in a dark room.
5. _____ gas turns lime water milky.

State true or false. If false, correct the statement:

1. Inhaled air contains a large amount of carbon-di-oxide.
2. Planting trees help in decreasing global warming.
3. The composition of air is always exactly the same.
4. Whales come up to the water surface to breathe in oxygen.
5. The balance of oxygen in atmosphere is maintained through photosynthesis in animals and respiration in plants.

Match the following:

1. Moving Air - Photosynthesis
2. Layer in which we live - Troposphere
3. Stratosphere - Wind
4. Oxygen - Ozone layer
5. Carbon-di-oxide - Combustion

Complete the analogy:

1. Photosynthesis: _____ :: Respiration: Oxygen
2. 78% of air: Does not support combustion :: _____ : supports combustion

Answers:**Choose the correct answer:**

1. 78% 2. Stomata 3. Oxygen 4. Keeps the food fresh 5. Nitrogen and Oxygen

Fill in the blanks:

1. Oxygen 2. Oxygen 3. Oxygen 4. Dust particles 5. Carbon-dioxide

Say True or False:

1. False

Correct Statement: Inhaled air contains large amount of oxygen.

2. True

3. False

Correct Statement: The composition of air varies from place to place.

4. True

5. False

Correct Statement: The balance of oxygen in atmosphere is maintained through photosynthesis in plants and respiration in animals.

Match the following:

1. Wind 2. Troposphere 3. Ozone layer 4. Combustion 5. Photosynthesis

Complete the analogy:

1. Carbon-dioxide 2. 21% of air

6th Science Lesson 12

12] The Cell

Do You Know?

Can you see a cell with your naked eyes? Cells are very minute and said to be microscopic cannot be seen with our naked eyes. They can be observed only through a specialized scientific instrument called "microscope". Now a days an electron microscope is used to magnify the cells and observe the cells.

Cell size has no relation to the size of an organism. It is not necessary that the cells of, say an elephant be much larger than those of a mouse.

Approximate number of cells in the human body is 3.7×10^{13} or 37,000,000,000,000.

Choose the best answers:

1. The unit of measurement used for expressing dimension (size) of cell is _____

(a) Centimetre

(b) millimetre

(c) micrometre

(d) Metre

2. Under the microscope Priya observes a cell that has a cell wall and distinct nucleus. The cell that she observed is

(a) A plant cell

(b) An animal cell

(c) A nerve cell

(d) A bacteria cell

3. A 'control centre' of the eukaryotic cell is

- (a) Cell wall
- (b) Nucleus
- (c) Vacuoles
- (d) Chloroplast

4. Which one of the following is not a unicellular organism?

- (a) Yeast
- (b) Amoeba
- (c) Spirogyra
- (d) Bacteria

5. Most organelles in a eukaryotic cell found in the_____?

- (a) Cell wall
- (b) Cytoplasm
- (c) Nucleus
- (d) Vacuole

Fill in the blanks:

1. The instrument used to observe the cell is _____
2. I control the food production of a cell. Who am I? _____
3. I am like a policeman. Who am I? _____
4. The term "cell" was coined by _____
5. The egg of an Ostrich is the _____ single cell.

State true or false. If false, correct the statement:

1. A cell is the smallest unit of life.
2. Nerve cell is the longest cell.
3. Prokaryotes were the first form of life on earth.
4. The organelles of both plants and animals are made up of cells.
5. New cells are produced from existing cells.

Match the following:

1. Control centre - Cell membrane
2. Food producer (Plant cell) - Mitochondria

3. Gate of the nucleus - Nucleus

4. Gate of the cell - Chloroplast

5. Energy producer - Nuclear membrane

Arrange in a correct sequence:

1. Elephant, cow, bacteria, mango, Rose plant.

2. Hen egg, ostrich egg, insect egg.

Complete the analogy:

1. Prokaryote: Bacteria :: Eukaryote: _____

2. Spirogyra: Plant cell :: Amoeba: _____

3. Food producer: Chloroplasts :: power house: _____

Answers:

Choose the correct answer:

1. Micro meter 2. A Plant cell 3. Nucleus 4. Spirogyra 5. Cytoplasm

Fill in the blanks:

1. The Microscope 2. Chloroplast 3. Cell Wall 4. Robert Hooke 5. Largest

Say True or False:

1. True

2. True

3. True

4. False

Correct Statement: The cells of both plants and animals are made up of Organelles.

5. True

Match the following:

1. Nucleus 2. Chloroplast 3. Nuclear membrane 4. Cell membrane 5. Mitochondria

Arrange in a correct sequence:

1. Bacteria, Rose plant, Mango, Cow, Elephant

2. Insect egg, Hen egg, Ostrich egg

Complete the analogy:

1. Alga 2. Animal cell 3. Mitochondria

6th Science Lesson 13

13] Human Organ Systems

Do You Know?

The smallest bone in our body is present inside the ear. It is called Stapes. It is only 2.8 millimetres long (average length). The longest bone in the body is the thigh bone. (Femur)

A new born baby has more than 300 bones. As the baby grows, some bones are joined together, hence the skeleton of an adult has 206 bones.

Each lung has about 300 million air sacs or alveoli. Yawning helps us to take in more amount of O_2 and to give out CO_2 .

Donate blood: Hospitals have blood banks where blood can be temporarily stored before it is given to the patients in need. Every healthy person over 18 years of age can donate blood. So that, it can be given to persons in need during emergencies of accidents or operations. Blood donation saves their life.

Brain is said to store as many as 100 million bits of information in a life time.

Take care of your sense organs: Do not read in very bright or very dim light and also in moving vehicle. Avoid exposing eyes to screens of television, computer, laptop and cell phone for a long time. Do not rub your eyes harshly. Wash your eyes gently with clean water, two or three times a day. Ears should be protected from hard blows. One should never try to prick ears with toothpicks or hairpins, which are dangerous practices because it may puncture the ear drum and cause ear infection. One should bathe at least once a day to keep skin clean and fresh.

Why do we drink water? Our body contains about 70% water. Some parts have more water like the grey matter of the brain (about 85%) and some less, like fat cells (about 15%). We normally consume 1.5 to 3.5 litres of water every day in the form of food and water.

Choose the best answers:

1. Circulatory system transports these throughout the body

- (a) Oxygen
- (b) Nutrient
- (c) Hormones
- (d) All of these

2. Main organ of respiration in human body is

- (a) Stomach
- (b) Spleen
- (c) Heart
- (d) Lungs

3. Breakdown of food into smaller molecules in our body is known as

- (a) Muscle contraction

(b) respiration

(c) Digestion

(d) Excretion

Fill in the blanks:

1. A group of organs together make up an _____ system.
2. The part of the skeleton that protects the brain is _____
3. The process by which the body removes waste is _____
4. The _____ is the largest sense organ in our body.
5. The endocrine glands produce chemical substances called _____

State true or false. If false, correct the statement:

1. Blood is produced in the bone marrow.
2. All the waste products of the body are excreted through the circulatory system.
3. The other name of food pipe is alimentary canal.
4. Thin Tube like structures which are the component of circulatory system are called blood vessels.
5. The brain, the spinal cord and nerves form the nervous system.

Match the following:

1. Ear - cardiac muscle
2. Skeletal system - flat muscle
3. Diaphragm - sound
4. Heart - Air sacs
5. Lungs - protection of internal organs

Arrange in sequence:

1. Stomach → Large intestine → oesophagus → pharynx → mouth → small intestine → rectum → anus
2. Urethra → Ureter → urinary bladder → kidney

Complete the analogy:

1. Arteries: carry blood from the heart :: _____: carry blood to the heart.
2. Lungs: respiratory system :: _____: circulatory system
3. Enzymes: digestive glands :: _____: endocrine glands

Answers:

Choose the best answers:

1. Oxygen, Nutrient and Hormones 2. Lungs 3. Digestive system

Fill in the blanks:

1. Organ 2. The Skull 3. Excretion 4. Skin 5. Hormones

Say True or False:

1. True

2. False

Correct Statement: All the waste products of the body are excreted through the excretory system.

3. True

4. False

Correct Statement: Thin like tube structures which are the components of the circulatory system are called as capillaries.

5. False

Correct Statement: The Brain, Spinal cord, the nerves and the sensory organ forms the nervous system.

Match the following:

1. Sound 2. Protection of internal organs 3. Flat muscle 4. Cardiac muscle 5. Air sacs

Arrange in sequence:

1. Mouth→Pharynx→Oesophagus→Stomach→Small intestine→Large intestine→Rectum→Anus

2. Kidney→Ureter→Urinary Bladder→Urethra

Complete the analogy:

1. Veins 2. Heart 3. Hormones

6th Science Lesson 14

14] Parts Of Computer

Do You Know?

A DVD is capable of storing 6 times more data than a CD.

Choose the best answers:

1. Which one of the following is an output device?

(a) Mouse

(b) Keyboard

(c) Speaker

(d) Pen drive

2. Name the cable that connects CPU to the Monitor

- (a) Ethernet
- (b) Power Cord
- (c) HDMI
- (d) USB

3. Which one of the following is an input device?

- (a) Speaker
- (b) Keyboard
- (c) Monitor
- (d) Printer

4. Which one of the following is an example for wireless connections?

- (a) Wi-Fi
- (b) Electric wires
- (c) VGA
- (d) USB

5. Pen drive is _____ device.

- (a) Output
- (b) Input
- (c) Storage
- (d) Connecting cable

Match the following:

- 1. VGA - Input device
- 2. Bluetooth - Connecting cable
- 3. Printer - LDMI
- 4. Keyboard - wireless connection
- 5. HDMI - output device

Answers:

Choose the best answers:

1. Speaker 2. HDMI 3. Keyboard 4. Wi-Fi 5. Storage

Match the following:

6th Science Lesson 15**15] Magnetism****Do You Know?**

The directive property of magnets has been used for centuries to find directions. Around 800 years ago, the Chinese discovered that a suspended lode stone stops in the north-south direction. Chinese used these lode stones to find directions.

The navigators of that country used to keep a piece of lode stone suspended in their boats and during a storm or mist, they used the lode stone to locate directions.

Magnets lose their properties when they are placed near Cell phone, Computer, DVDs. These objects will also get affected by magnetic field.

Choose the best answers:

1. An object that is attracted by magnet.

- (a) Wooden piece
- (b) Plain pins
- (c) Eraser
- (d) A piece of paper

2. People who made mariner's compass for the first time.

- (a) Indians
- (b) Europeans
- (c) Chinese
- (d) Egyptians

3. A freely suspended magnet always comes to rest in the _____

- (a) North – East
- (b) South – West
- (c) East – West
- (d) North – south

4. Magnets lose their properties when they are

- (a) Used
- (b) Stored
- (c) Hit with a hammer

(d) Cleaned

5. Mariner's compass is used to find the

- (a) Speed
- (b) Displacement
- (c) Direction
- (d) Motion

Fill in the blanks:

1. Artificial magnets are made in different shapes such as _____ and _____.
2. The Materials which are attracted towards the magnet are called _____.
3. Paper is not a _____ material.
4. In olden days, sailors used to find direction by suspending a piece of _____.
5. A magnet always has _____ poles.

State true or false. If false, correct the statement:

1. A cylindrical magnet has only one pole.
2. Similar poles of a magnet repel each other.
3. Maximum iron filings stick in the middle of a bar magnet when it is brought near them.
4. A compass can be used to find East-West direction at any place.
5. Rubber is a magnetic material.

Match the following:

1. Compass - Maximum magnetic strength
2. Attraction - Like poles
3. Repulsion - Opposite poles
4. Magnetic poles - Magnetic needle

Circle the odd ones and give reasons:

1. Iron nail, pins, rubber tube, needle.
2. Lift, escalator, electromagnetic train, electric bulb.
3. Attraction, repulsive, pointing direction, illumination.

Answers:

Choose the best answers:

1. Plain pins 2. Chinese 3. North-South 4. Hit with a hammer 5. Direction

Fill in the blanks:

1. Bar magnet, Horseshoe magnet, Ring magnet 2. Magnetic substances 3. Magnetic 4. Lode stones 5. Two

Say True or False:

1. False

Correct Statement: A cylindrical magnet has two poles.

2. True

3. False

Correct Statement: maximum iron fillings stick in the poles of a bar magnet when it is brought near them.

4. True

Correct Statement: A compass always indicates the North-South direction. By using this property of magnets the East-West direction can be determined which is always perpendicular to the compass needle in the same plane.

5. False

Correct Statement: Rubber is a non-magnetic material.

Match the following:

1. Magnetic needle 2. Opposite poles 3. Like poles 4. Maximum magnetic strength

Circle the odd ones and give reasons:

1. Rubber tube (Rubber is a non-magnetic material; all the others are magnetic material)

2. Electric bulb (Electric bulb does not have electromagnets. All the other has electromagnets)

3. Illumination (Illumination is not a magnetic property all the other denotes the property of a magnet)

6th Science Lesson 16**16] Water****Do You Know?**

Water while passing through layers of soil dissolves salts and minerals to a maximum extent. These salts and minerals have been deposited in seas and oceans for millions of years and are still being deposited. In addition, the oceanic volcanoes which are present inside, also add salts to the sea. Water with large amounts of dissolved solids is not portable or suitable for drinking. Such water is called saline water.

Water freeze at 0° Celsius at normal pressure. Every year March 22nd is observed as the world water day.

The Himalayas: The Himalayas contain ice caps, ice bergs and glaciers. Ten of Asia's largest rivers flow from the Himalayas and more than a billion people's livelihoods depend on those rivers.

Water, is measured in litre and millilitre. Gallon is also a measure of volume of liquids. 1 Gallon = 3.785 litre. Water level in the reservoirs is measured in TMC (One thousand million cubic feet). Water released from dams is measured in cusec (cubic feet/sec).

Aquatic animals: During winter, water in lakes and ponds in the cold countries will be frozen and a solid layer of ice is formed on the surface of water. Still aquatic animals living under the ice do not die. This is because the floating layer of ice acts as a protective coat, and doesn't permit heat to escape from water. So as the water at the surface alone turns to ice, it the existence of aquatic animals.

Koovam is an estuary! Estuaries are wetlands where water bodies meet the sea. It is a combination of fresh water from land meeting the salty seawater. Estuaries are home to unique plants and animal species.

Swamps are wetlands that are forested. They occur along large rivers or on the shores of large lakes. The water of a swamp may be freshwater, brackish water or seawater. Swaps are important for providing fresh water and oxygen to all life. Pichavaram Mangroves in Chidambaram, Muthupet mangrove wetland. Pallikaranai wetland in Chennai, Chembarambakkam in Kancheepuram is a few examples of swamps in Tamil Nadu.

Choose the best answers:

1. Around 97% of water available on earth is _____ water.

- (a) Fresh
- (b) Pure
- (c) Salty
- (d) Polluted

2. Which of the following is not a part of water cycle?

- (a) Evaporation
- (b) Condensation
- (c) Rain
- (d) Distillation

3. Which of the following processes add water vapour to the atmosphere?

i. Transpiration ii. Precipitation iii. Condensation iv. Evaporation

- (a) ii and iii
- (b) ii and iv
- (c) i and iv
- (d) i and ii

4. About 30% of the fresh water is found in?

- (a) Glaciers
- (b) Ground water
- (c) Other sources of water

(d) 0.3%

5. Using R.O. (Reverse Osmosis) plant at home eliminates lot of non-potable water. The best way to effectively use the expelled water of R.O. plant is _____

(a) Make the expelled water go and seep near the bore well

(b) Use it for watering plants

(c) To drink the expelled water after boiling and cooling

(d) To use for cooking as the water is full of many nutrients

Fill in the blanks:

1. Only _____ percent of natural water is available for human consumption.

2. The process of changing water into its vapour is called _____

3. _____ is built on rivers to regulate water flow and distribute water.

4. Water levels in rivers increase greatly during _____

5. Water cycle is also called as _____

State true or false. If false, correct the statement:

1. Water present in rivers, lakes and ponds is unfit for use by human beings.

2. Seas are formed when the water table meets the land surface.

3. The evaporation of water takes place only in sunlight.

4. Condensation results in the formation of dew on grass.

5. Sea water can be used for irrigation as such.

Match the following:

1. Flood - Lake

2. Surface water - Evaporation

3. Sun light - Water vapour

4. Cloud - Pole

5. Frozen water - Increased rain fall

Complete the analogy:

1. Population explosion: Water scarcity :: Recycle: _____

2. Ground water: _____ :: Surface water: lakes

Answers:

Choose the best answer:

1. Salty 2. Distillation 3. Transpiration and Evaporation 4. Ground water 5. Use it for watering plants

Fill in the blanks:

1. 0.3% 2. Evaporation 3. Dam 4. Raining season 5. Hydrological cycle

Say True or False:

1. False

Correct Statement: Water present in rivers, lakes and ponds is fit for use by human beings.

2. False

Correct Statement: Ponds are formed when the water table meets the land surface.

3. True

4. True

5. False

Correct Statement: Sea water cannot be used for irrigation because of its high salinity.

Match the following:

1. Increased rainfall 2. Lake 3. Evaporation 4. Water vapour 5. Pole

Complete the Analogy:

1. Water management 2. Tube wells

6th Science Lesson 17**17] Chemistry In Everyday Life****Do You Know?**

When we cut onion, we get tears in the eyes with irritation, because of the presence of a chemical, propanethial s-oxide in onion. This is easily volatile. When we cut onion some of the cells are damaged and this chemical comes out. It becomes vapour and reach our eyes result in irritation and tears in eyes. When we crush the onion, more cells will be damaged and more chemicals come out.

Earthworms take organic wastes as food and produce compost castings. So earthworms are known as Farmers' friends because of the multitude of services they provide to improve soil health and consequently plant health.

In 1824, Joseph Aspdin invented Portland cement by burning finely ground chalk and clay in a kiln. It was named "Portland" cement because it resembled the high-quality building stones found in Portland, England.

Choose the best answers:

1. Soaps were originally made from _____.

(a) Proteins

(b) Animal fats and vegetable oils

(c) Chemicals extracted from the soil

(d) Foam booster

2. The saponification of a fat or oil is done using _____ solution for hot process.

(a) Ammonium hydroxide

(b) Sodium hydroxide

(c) Hydrochloric acid

(d) Sodium chloride

3. Gypsum is added to the cement for _____

(a) Fast setting

(b) Delayed setting

(c) Hardening

(d) Making paste

4. Phenol is _____

(a) Carbolic acid

(b) Acetic acid

(c) Benzoic acid

(d) Hydrochloric acid

5. Natural adhesives are made from _____

(a) Protein

(b) Fat

(c) Starch

(d) Vitamins

Fill in the blanks:

1. _____ gas causes tears in our eyes while cutting onions.

2. Water, coconut oil and _____ are necessary for soap preparation.

3. _____ is called as farmer's best friend.

4. _____ fertilizer is eco-friendly.

5. _____ is an example for natural adhesive.

State true or false. If false, correct the statement:

1. Concentrated phenol is used as a disinfectant.

2. Gypsum is largely used in medical industries.

3. Plaster of Paris is obtained from heating gypsum.

4. Adhesives are the substances used to separate the components.

5. NPK is the primary nutrients for plants.

Match the following:

1. Soap - C_6H_5OH

2. Cement - $CaSO_4 \cdot 2H_2O$

3. Fertilizers - NaOH

4. Gypsum - RCC

5. Phenol - NPK

Complete the analogy:

1. Urea: Inorganic fertilizer :: Vermicompost: _____

2. _____: Natural adhesives :: Cello tape: Artificial adhesives.

Answers:

Choose the best answers:

1. Animal fats and vegetable oils 2. Sodium hydroxide 3. Delayed setting 4. Carboric acid 5. Starch

Fill in the blanks:

1. Propanethial-s-oxide 2. Animal fat 3. Earthworms 4. Organic 5. Starch dissolved in water

Say True or False:

1. False

Correct Statement: Low concentrated phenol is used as a disinfectant.

2. False

Correct Statement: Gypsum is largely used in cement preparations.

3. True

4. False

Correct Statement: Adhesives are the substances used to join the components.

5. True

Match the following:

1. NaOH 2. RCC 3. NPK 4. $CaSO_4 \cdot 2H_2O$ 5. C_6H_5OH

Complete the Analogy:

1. Organic fertilizers 2. Starch dissolved in water

6th Science Lesson 18

18] Our Environment

Do You Know?

Aquarium: Aquarium is a place in which fish and other water creatures and plants are maintained. An aquarium can be small tank, or a large building with one or more large tanks.

Terrarium: Terrarium is a place in which live terrestrial animals as well as plants are maintained. With controlled conditions that copy their natural environment.

Aquariums and Terrariums are used to observe animals and plants more closely. They are also used for decorations.

Creative reuse: Creative reuse or Up-cycling is the process of converting waste materials or useless products into new materials or products of better quality or for better environmental value. When you up cycle, you are giving an item a new purpose, (e.g.) Used tyres into chairs. Used PET bottle into pen stand

How much waste does each person make around the world every day?

The average person in India produces 0.45 kg of waste every day. It may be small amount of waste. But, India has a large population and imagine you collected all the waste today and put it into tractors. You would fill so many tractors that you could create a traffic jam approximately 2,800 kilometres long. Imagine, a road all the way from Kanyakumari to New Delhi completely blocked with tractors carrying garbage and no space to walk in between. This is how much waste we create in India each day! If we reduce the waste, we reduce the pollution. Every day 532 million kilos of solid waste is generated in India.

Choose the best answers:

1. Identify the fresh water ecosystem.

- (a) Pond
- (b) Lake
- (c) River
- (d) All of them

2. Producers are _____

- (a) Animals
- (b) Birds
- (c) Plants
- (d) Snakes

3. It is a biodegradable waste

- (a) Plastic
- (b) Coconut Shell
- (c) Glass

(d) Aluminium

4. It is an undesirable change that occurs in air and water

(a) Recycling

(b) Reuse

(c) Pollution

(d) Reduce

5. Usage of chemical pesticides and fertilisers causes _____ pollution.

(a) Air pollution

(b) Water pollution

(c) Noise pollution

(d) None of the above

Fill in the blanks:

1. Primary consumers that eat plants are called _____

2. Temperature, light and wind are _____ factors.

3. _____ is the process of converting waste materials into new materials.

4. Water pollution can spread _____ and chemicals.

5. The 3R's are Reduce, _____ and Recycle.

State true or false. If false, correct the statement:

1. The Pacific Ocean is an example of a marine ecosystem.

2. Bacteria and fungi are called decomposers.

3. Human and animal wastes are example of non-biodegradable waste.

4. Excessive use of pesticides leads to air pollution.

5. In schools, waste management rules say that we should separate waste in two categories.

Match the following:

1. Biotic factor - Terrestrial Ecosystem

2. Sewage - Land pollution

3. Fertilizers - Air pollution

4. Desert - Water Pollution

5. Smoke - Animals

Arrange the following in a correct sequence and form a food chain:

1. Rabbit → Carrot → Eagle → Snake

2. Human → Insect → Algae → Fish

Answers:

Choose the best answers:

1. Pond, Lake and River 2. Plants 3. Coconut shell 4. Pollution 5. Water Pollution

Fill in the blanks:

1. Herbivores 2. Physical 3. Recycling 4. Diseases 5. Reuse

Say True or False:

1. True

2. True

3. False

Correct Statement: Human and animal wastes are examples of biodegradable wastes.

4. False

Correct Statement: Excessive use of pesticide leads to water pollution.

5. True

Match the following:

1. Animals 2. Water pollution 3. Land pollution 4. Terrestrial Ecosystem 5. Air pollution

Arrange the following in a correct sequence and form a food chain:

1. Carrot→Rabbit→Snake→Eagle

2. Algae→Insect→Fish→Human

6th Science Lesson 19

19] Plants In Daily Life

Do You Know?

India is the second largest producer of fruits and vegetables in the world.

World Food Day, October – 16. The aim of celebration of this day is to promote worldwide awareness and action for those who suffer from hunger and for the need to ensure food security and nutritious diets for all.

Each year, World Food Day is celebrated of the Food and Agriculture Organization of the United Nations (FAO). World Food Day adopts a different theme each year. Ask your teacher about the theme of this year.

In India, Jute crop is grown in seven states – West Bengal, Assam, Odisha, Bihar, Uttar Pradesh, Tripura and Meghalaya. West Bengal alone accounts for over 50% of raw jute production.

The finely cut wooden boards from the wood are layered one above the other to make plywood. This is a kind of composite wood.

Pala spinach: Osteoarthritis is a joint disease affecting joints and knee of any age people. Currently Indian scientists at CDRI (Central Drug Research Institute – Lucknow) have made a nano formulation from the Palak (Pala spinach) to cure this disease.

Choose the best answers:

1. One of the following birds is an example of plant pollinator

- (a) Duck
- (b) Parrot
- (c) Humming bird
- (d) Dove

2. Natural Mosquito repellent is

- (a) Nutmeg
- (b) Bamboo
- (c) Ginger
- (d) Neem

3. Which of the following is not a root?

- (a) Potato
- (b) Carrot
- (c) Radish
- (d) Turnip

4. Which of the following medicinal plants has anticancer properties?

- (a) Amla
- (b) Tulsi
- (c) Turmeric
- (d) Aloe

5. Which is the national tree of India?

- (a) Neem tree
- (b) Jack tree
- (c) Banyan tree
- (d) Mango tree

Fill in the blanks:

1. Every year, October _____ is celebrated as world food day.
2. _____ is an example of textile fibre.
3. I am the state tree of Tamil Nadu. Who am I? _____
4. The juice of the leaves of _____ plant relieves cough and bronchitis.
5. The edible seeds of leguminous plants are called _____

State true or false. If false, correct the statement:

1. Plants grown for decorative purposes are called as softwood.
2. Silkworm eats mulberry leaves.
3. Cauliflower is used for ornamental purpose.
4. Cotton cloth is not suitable for summer season.
5. Sugarcane is used as bio fuel.

Match the following:

1. Fibre yielding plant - Chloramine
2. Hardwood - Spice
3. Neem - Hemp
4. Clove - Cereals
5. Millet - Teakwood

Complete the analogy:

1. Mango: Fruit :: Maize: _____
2. Coconut: Fibre :: Rose: _____
3. Bees: Pollinate insect :: Earthworms: _____

Answers:**Choose the best answers:**

1. Humming Bird 2. Neem 3. Potato 4. Turmeric 5. Banyan Tree

Fill in the blanks:

1. Sixteen 2. Cotton 3. Palm tree 4. Tulsi 5. Pulses

Say True or False:

1. False

Correct Statement: Plants grown for decorative purposes are called as Ornamental plants.

2. True

3. False

Correct Statement: Jasmine is used for ornamental purpose.

4. False

Correct Statement: Cotton cloth is suitable for summer season.

5. True

Match the Following:

1. Hemp 2. Teakwood 3. Chloramine 4. Spice 5. Cereals

Complete the Analogy:

1. Cereals 2. Ornamental 3. Natural manure

6th Science Lesson 20

20] Hardware And Software

Do You Know?

Email existed before the World Wide Web.

The Open Source Initiative (OSI) is an organization dedicated to promote Open Source Software.

Choose the best answers:

1. Find out the part that is not found in CPU?

(a) Mother Board

(b) SMPS

(c) RAM

(d) Mouse

2. Which of the following is correct?

(a) Free and Open source

(b) Free and Traditional software

(c) Passive and Open source

(d) Passive and Traditional source

3. LINUX is a

(a) Paid software

(b) Licensed software

(c) Free and Proprietary software

(d) Free and Open source software

4. Find out Paid and Proprietary software from the given list

(a) Windows

(b) MAC OS

(c) Adobe Photoshop

(d) All the above

5. _____ is an Operating System.

(a) Android

(b) Chrome

(c) Internet

(d) Pen drive

Match the following:

1. MAC OS - Free and Open Source Software

2. Software - Paid and Proprietary Software

3. Hardware - Input Device

4. Keyboard - RAM

5. LINUX - Geogebra

Answers:

Choose the best answers:

1. Mouse 2. Free and Open source 3. Free and Open Source Software 4. Windows, MAC OS and Adobe Photoshop
5. Android

Match the following:

1. Paid and Proprietary software 2. Geogebra 3. RAM 4. Input Device 5. Free and Open source software

7th Science Lesson 1

1] Measurement

Do You Know?

One square metre is the area enclosed inside a square of side 1 metre.

Problem 1.1: What is the area of a 10 square each of side of 1 m.

Solution: Area of a square = side x side

= 1 m x 1 m = 1m² or 1 square metre

Area of 10 squares = 1 square metre x 10 = 10 square metre

(Even though the area is given in square metre, the surfaces need not to be square in shape)

Problem 1.2: Find the area of the following regular shaped figures: (Take $\pi = 22/7$). (a) A rectangle whose length is 12 m and breadth is 4 m. (b) A circle whose radius is 7 m. (c) A triangle whose base is 6 m and height is 8 m.

Solution: (a) Area of rectangle = length x breadth = 12 x 4 = 48 m²

(b) Area of circle = $\pi \times r^2 = (22/7) \times 7 \times 7 = 154 \text{ m}^2$

(c) Area of triangle = $(1/2) \times \text{base} \times \text{height} = (1/2) \times 6 \times 8 = 24 \text{ m}^2$

Problem 1.3: Find the volume of (Take $\pi = 22/7$). (i) a cube whose side is 3 cm. (ii) a cylinder whose radius is 3 m and height is 7 m.

Solution: (a) Volume of a cube = side x side x side = 3 cm x 3 cm x 3 cm = 27 cubic cm or cm³.

(b) Volume of a cylinder = $\pi \times r^2 \times \text{height} = (22/7) \times 3 \times 3 \times 7 = 198 \text{ m}^3$.

To measure the volume of liquids, some other units are also used, some of them are gallon ounce and quart.

1 gallon = 3785 ml

1 ounce = 30 ml

1 quart = 1 litre

Problem 1.4: A solid cylinder of mass 280 kg has a volume of 4 cm³. Find the density of cylinder.

Solution: Density of cylinder = mass of cylinder/volume of cylinder = 280/4 = 70 kg/m³

Problem 1.5: A box is made up of iron and it has a volume of 125 cm³. Find its mass. (Density of iron is 7.8 g/cm³).

Solution: Density = Mass/Volume

Hence, Mass = Volume x Density = 125 x 7.8 = 975 g.

Problem 1.6: A sphere is made from copper whose mass is 3000 kg. If the density of copper is 8900 kg/m³, find the volume of the sphere.

Solution: Density = Mass/Volume

Hence, Volume = Mass/Density = 3000/8900 = 30/89 = 0.34 m³.

Water has more density than oils like cooking oil and castor oil, although this oil appears to be denser than water. Density of castor oil is 961 kg/m³. If we put one drop of water in oil, water drop sinks. But, if we put one drop of oil in water, oil floats and forms a layer on water surface. However, some oils are denser than water.

Choose the best answers:

1. Which of the following is a derived unit?

(a) Mass

(b) Time

(c) Area

(d) Length

2. Which of the following is correct?

(a) 1L = 1 cc

(b) 1L = 10 cc

(c) 1L = 100 cc

(d) 1L = 1000 cc

3. SI unit of density is

(a) kg/m^2

(b) kg/m^3

(c) kg/m

(d) g/m^3

4. Two spheres have equal mass and volume in the ratio 2:1. The ratio of their density is

(a) 1:2

(b) 2:1

(c) 4:1

(d) 1:4

5. Light year is the unit of

(a) Distance

(b) Time

(c) Density

(d) Both length and time

Fill in the blanks:

1. Volume of irregularly shaped objects is measured using the law of _____

2. One cubic metre is equal to _____ cubic centimetre.

3. Density of mercury is _____

4. One astronomical unit is equal to _____

5. The area of a leaf can be measured using a _____

State true or false. If false, correct the statement:

1. The region covered by the boundary of the plane figure is called its volume.

2. Volume of liquids can be found using measuring containers.

3. Water is denser than kerosene.

4. A ball of iron floats in mercury.

5. A substance which contains less number of molecules per unit volume is said to be denser.

Match the items in column – I to the items in column II:

(1)

Column I - Column II

i. Area - (a) light year

ii. Distance - (b) m^3

iii. Density - (c) m^2

iv. Volume - (d) kg

v. Mass - (e) kg/m^3

(2)

Column I - Column II

i. Area - (a) g/cm^3

ii. Length - (b) measuring jar

iii. Density - (c) amount of a substance

iv. Volume - (d) rope

v. Mass - (e) plane figures

Arrange the following in correct sequence:

1. 1L, 100 cc, 10 L, 10 cc

2. Copper, Aluminium, Gold, Iron

Complete the analogy:

1. Area: m^2 :: Volume: _____

2. Liquid: Litre :: Solid: _____

3. Water: Kerosene :: _____: Aluminium

Consider the statements given below and choose the correct option:

Mark the correct choice as

(a) If both assertion and reason are true and reason is the correct explanation of assertion

(b) If both assertion and reason are true but reason is not the correct explanation of assertion

(c) If assertion is true but reason is false

(d) If assertion is false but reason is true

1. Assertion: Volume of a stone is found using a measuring cylinder.

Reason: Stone is an irregularly shaped object.

2. Assertion: Wood floats in water.

Reason: Water is a transparent liquid.

3. Assertion: Iron ball sinks in water.

Reason: Water is denser than iron.

Answers:

Choose the correct answers:

1. Area 2. $1\text{L}=1000\text{ cc}$ 3. Kg/m^3 4. 2:1 5. Distance

Fill in the blanks:

1. Archimedes 2. 100 3. $13600\text{kg}/\text{m}^3$ 4. $4.1496 \times 10^{11}\text{m}$ 5. Graphical method

State True or False:

1. False

Correct Statement: The region covered by the boundary of the plane figure is called its area.

2. True

3. True

4. True

5. False

Correct Statement: A substance which contains more number of molecules per unit volume is said to be denser.

Match the following:

1.i. m^2 ii. Light year iii. Kg/m^3 iv. m^3 v. kg

2.i. Plane figures ii. Rope iii. g/cm^3 iv. Measuring jar v. Amount of a substance

Arrange the following in correct sequence:

1. 10 cc, 100cc, 1L, 10L

2. Aluminium, Iron, Copper, Gold

Complete the analogy:

1. m^3 2. Cubic metre 3. Iron

Consider the statements given below and choose the correct option:

1. Assertion is false but reason is true.

2. Both assertion and reason are true and reason is the correct explanation of assertion.

3. Assertion is true but reason is false.

7th Science Lesson 2

2] Force And Motion

Do You Know?

Nautical mile: Nautical mile is the unit for measuring the distance in the field of aviation and sea transportation. One nautical mile is 1.852 km. The unit for measuring the speed of aeroplane and ships is knot. One knot is the speed taken to travel one nautical mile in hour.

1 km/h = 5/18 m/s. How we got this?

$$1 \text{ km} = 1000 \text{ m}$$

$$1 \text{ h} = 3600 \text{ s}$$

$$1 \text{ km/h} = 1000 \text{ m}/3600 \text{ s} = 5/18 \text{ m/s}$$

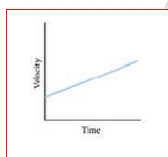
Cheetah: My name is cheetah. I can run at a great speed. Do you know what my speed is? 25 m/s to 30 m/s. My speed changes from 0 to 20 m/s in 2 seconds. See how good my acceleration is!

Choose the best answers:

1. A particle is moving in a circular path of radius r . The displacement after half a circle would be

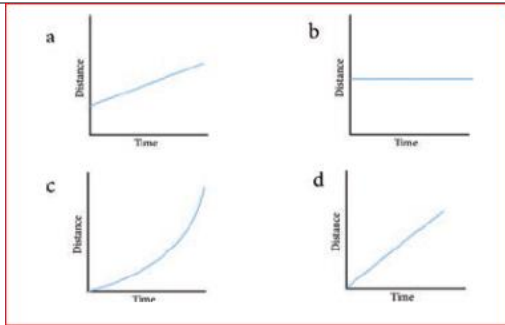
- (a) Zero
- (b) R
- (c) $2r$
- (d) $r/2$

2. From the given v-t graph it can be inferred that the object is



- (a) In uniform motion
- (b) At rest
- (c) In non uniform motion
- (d) Moving with uniform acceleration

3. Which of the following figures represent uniform motion of a moving object correctly?



4. Suppose a boy is enjoying a ride on a merry go round which is moving with a constant speed of 10 m/s. It implies that the boy is

- (a) At rest
- (b) Moving with no acceleration
- (c) In accelerated motion
- (d) Moving with uniform velocity

5. What is one way you might increase the stability of an object?

- (a) Lower the centre of gravity
- (b) Raise the centre of gravity
- (c) Increase the height of the object
- (d) Shorten the base of the object

Fill in the blanks:

1. The shortest distance between the two places is _____
2. The rate of change of velocity is _____
3. If the velocity of an object increases with respect to time, then the object is said to be in _____ acceleration.
4. The slope of the speed-time graph gives _____
5. In _____ equilibrium its centre of gravity remains at the same height when it is displaced.

Match the following:

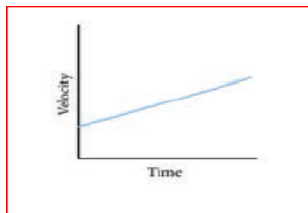
1. Displacement - Knot
2. Light travels through vacuum - Geometric centre
3. Speed of ship - Metre
4. Centre of gravity of the geometric shaped object - Larger base area
5. Stability - Uniform velocity

Complete the analogy:

1. Velocity: metre/second :: acceleration: _____

2. Length of scale: metre :: speed of aeroplane: _____

3. Displacement/time: velocity :: speed/time: _____

Answers:**Choose the correct answers:**

1. 2R 2. In uniform motion 3. _____ 4. Moving with no acceleration 5. Lowers the centre of gravity

Fill in the blanks:

1. Straight path 2. Acceleration 3. Positive 4. Acceleration 5. Neutral

Match the following:

1. Metre 2. Uniform velocity 3. Knot 4. Geometric centre 5. Larger base area

Complete the analogy:

1. metre/ s² 2. Knot 3. Distance

7th Science Lesson 3**3] Matter Around Us****Do You Know?**

The most abundant type of atom in the universe is the hydrogen atom. Nearly 74% of the atoms in the universe are hydrogen atoms. However on Earth the three most abundant atom are iron, oxygen and silicon.

Bismuth in diarrhea medicine: Bismuth is an element that occurs naturally. It is combined with other elements to make medicine for treating diarrhea.

The Robert Boyle is the first scientist used the term element. An early proponent of the elemental nature of matter and the nature of vacuum. He was known best for Boyle's Law.

In the beginning, the names of elements were derived from the name of the place where they were found for the first time. For example, the name copper was taken from Cyprus. Some names were taken from specific colours. For example, gold was taken from the English word meaning yellow. Now-a-days, IUPAC approves names of elements. Many of the symbols are the first one or two letters of the element's name in English. The first letter of a symbol is always written as a capital letter (uppercase) and the second letter as a small letter (lowercase).

How do hot-air balloons float? When air inside the hot air balloon is heated with a burner, it expands. The expansion causes the density of the air inside the balloon to decrease. Hence, the air inside the balloon has a lower density than the air outside of the balloon. This difference in density allows the hot-air balloon to float.

Choose the best answers:

1. Which of the following is an example of a metal?

- (a) Iron
- (b) Oxygen
- (c) Helium
- (d) Water

2. Oxygen, hydrogen and sulphur are examples of which of the following?

- (a) Metals
- (b) Non-metals
- (c) Metalloids
- (d) Inert gases

3. Which of the following is a short and scientific way of representing one molecule of an element or compound?

- (a) Mathematical formula
- (b) Chemical formula
- (c) Mathematical symbol
- (d) Chemical symbol

4. The metals which is a liquid at room temperature

- (a) Chlorine
- (b) Sulphur
- (c) Mercury
- (d) Silver

5. An element which is always lustrous, malleable and ductile

- (a) Non-metal
- (b) Metal
- (c) Metalloid
- (d) Gas

Fill in the blanks:

1. The smallest particle of matter that can exist by itself _____
2. A compound containing one atom of carbon and two atoms of oxygen is _____
3. _____ is the only non-metal conducts electricity.
4. Elements are made up of _____ kinds of atoms.

5. _____ of some elements are derived from Latin or Greek names of the elements.
6. There are _____ number of known elements.
7. Elements are the _____ form of pure substances.
8. The first letter of an element always written in _____ letter.
9. Molecule containing more than three atoms is known as _____
10. _____ is the most abundant gas in the atmosphere.

Complete the analogy:

1. Mercury: liquid at room temperature :: Oxygen: _____
2. Non metal conducting electricity: _____ :: Metal conducting electricity: copper
3. Elements: combine to form compounds :: compounds :: _____
4. Atoms: fundamental particle of an element :: _____: fundamental particles of a compound.

State true or false. If false, correct the statement:

1. Two different elements may have similar atoms.
2. Compounds and elements are pure substance.
3. Atoms cannot exist alone; they can only exist as groups called molecules.
4. NaCl represents one molecule of sodium chloride.
5. Argon is mono atomic gas.

Answers:**Choose the best answer:**

1. Iron 2. Non-metals 3. Chemical formula 4. Mercury 5. Metal

Fill in the blanks:

1. Atom 2. Carbon di oxide 3. Graphite 4. Same 5. Symbols 6. 118
7. Simplest 8. Capital 9. Polyatomic 10. Nitrogen

Complete the analogy:

1. Gas at room temperature 2. Graphite 3. Combines to form mixtures 4. Molecules

State True or False:

1. False

Correct Statement: Two different elements may not have similar atoms.

2. True

3. False

Correct Statement: Atoms can exist alone.

4. True

5. True

7th Science Lesson 4

4] Atomic Structure

Do You Know?

Nanometre is the smallest unit used to measure small lengths. One metre is equal to 1×10^9 nm or one nano meter is equal to 1×10^{-9} m.

You have around 7 billion atoms in your body, yet you replace about 98% of them every year!

Is the structure of the atom the same as the structure of the solar system? Yes! It is similar to the solar system. It has a core centre called nucleus and it has paths called orbits around the nucleus.

Isotopes: Atoms of the same element can have different number of neutrons. Such atoms will have same atomic number but different mass numbers. These atoms are called isotopes. For example, Hydrogen has three isotopes ___ Hydrogen (${}_1\text{H}^1$), Deuterium (${}_1\text{H}^2$), and Tritium (${}_1\text{H}^3$).

Isobars: Atoms that have the same mass number but different atomic numbers. For example, Calcium – 40 and Argon – 40

WHAT MAKES ATOMS STICK TOGETHER? Electrons carry a negative electric charge and protons carry a positive charge. The attraction between them holds electrons in orbits.

Choose the best answers:

1. The basic unit of matter is _____

- (a) Element
- (b) Atom
- (c) Molecule
- (d) Electron

2. The subatomic particle revolve around the nucleus is _____

- (a) Atom
- (b) Neutron
- (c) Electron
- (d) Proton

3. _____ is positively charged.

- (a) Proton
- (b) Electron

(c) Molecule

(d) Neutron

4. The atomic number of an atom is _____

(a) Number of neutrons

(b) Number of protons

(c) Total number of protons and neutrons

(d) Number of atoms

5. _____ nucleons comprises of

(a) Protons and electrons

(b) Neutrons and electrons

(c) Protons and neutrons

(d) Neutrons and Positron

Fill in the blanks:

1. The smaller particles found in the atom is called _____

2. The nucleus has _____ and _____

3. The _____ revolve around the nucleus.

4. If the valency of carbon is 4 and that of hydrogen is 1, then the molecular formula of methane is _____

5. There are two electrons in the outermost orbit of the magnesium atom. Hence, the valency of magnesium is _____

Match the following:

1. Valency - Fe

2. Neutral Particle - Proton

3. Iron - Electron in the outermost orbit

4. Hydrogen - Neutron

5. Positively charged particle - Monovalent

State true or false. If false, correct the statement:

1. The basic unit of an element is molecule.

2. The electrons are positively charged.

3. An atom is electrically neutral.

4. The nucleus is surrounded by protons.

Complete the analogy:

1. Sun: Nucleus, planets: _____
2. Atomic number: _____, mass number: number of protons and neutrons.
3. K: Potassium, C: _____

Consider the statements given below and choose the correct option:

- (a) If both assertion and reason are true and reason is the correct explanation of assertion
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion
- (c) If assertion is true but reason is false
- (d) If assertion is false but reason is true

Consider the statements given below and choose the correct option:

- (a) If both assertion and reason are true and reason is the correct explanation of assertion
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion
- (c) If assertion is true but reason is false
- (d) If assertion is false but reason is true

1. Assertion: An atom is electrically neutral.

Reason: Atoms have equal number of protons and electrons.

2. Assertion: The mass of an atom is the mass of nucleus.

Reason: The nucleus is at the centre.

3. Assertion: The number of protons and neutrons is atomic number.

Reason: The mass number is sum of protons and neutrons.

Answers:**Choose the best answers:**

1. Atom 2. Electron 3. Proton 4. Number of protons 5. Protons and Neutrons

Fill in the blanks:

1. Electrons 2. Positive and negative charge 3. Electrons 4. CH_4 5. 2

Match the following:

1. Electron in the outermost orbit 2. Neutron 3. Fe 4. Monovalent 5. Proton

State True or False:

1. False

Correct Statement: The basic unit of an element is an atom.

2. False

Correct Statement: The electrons are negatively charged.

3. True

4. False

Correct Statement: The nucleus is surrounded by electrons.

Complete the analogy:

1. Electrons 2. Number of protons 3. Carbon

Consider the statements given below and choose the correct option:

1. Assertion is true but reason is false.

2. Assertion is false but reason is true

3. Assertion is false but reason is true.

7th Science Lesson 5

5] Reproduction And Modification In Plants

Do You Know?

The sunflower is not a single flower. It is a group of flowers clustered together. A group of flowers arranged together is called inflorescence. *Tridax procumbens*, looks like a single flower, but is an inflorescence. Leaf juice of this plant is used to cure wounds and cuts.

The world's largest and heaviest seed is the double coconut. The seed looks like two coconut fused together. It only grows in two islands of the Seychelles. A single seed may be 12 inches long, nearly 3 feet in circumference and weighs about 18 kg. Orchids have the smallest seeds in the plant kingdom. 35 million seeds may weight only about 25 gram.

Vanda is an epiphytic plant, which grows on trees. The velamen tissue present in the epiphytic root, absorbs moisture, to perform photosynthesis.

A root growing from a location other than the underground, such as from a stem or leaf is called as adventitious root.

Choose the best answers:

1. Vegetative propagation by leaves takes place in

(a) Bryophyllum

(b) Fungi

(c) Virus

(d) Bacteria

2. Asexual reproduction in yeast is

(a) Spore formation

(b) Fragmentation

(c) Pollination

(d) Budding

3. Reproductive part of a plant is

(a) Root

(b) Stem

(c) Leaf

(d) Flower

4. Pollinators are

(a) Wind

(b) Water

(c) Insect

(d) All the above

5. Climbing roots are seen in

(a) Betel

(b) Black pepper

(c) Both of them

(d) None of them

Fill in the blanks:

1. The male reproductive part of a flower is _____

2. _____ is the basal swollen part of the Gynoecium.

3. After fertilization the ovule becomes _____

4. Breathing roots are seen in _____ plants.

5. Onion and Garlic are example of _____

State true or false. If false, correct the statement:

1. A complete flower has four whorls.

2. The transfer of pollen to the stigma is known as pollination.

3. Conical shaped root is carrot.

4. Ginger is an underground root.

5. Leaves of Aloe Vera are fleshy and store water.

Match the following:

1. Petal - Opuntia
2. Fern - Chrysanthemum
3. Phylloclade - Attracts insect
4. Hooks - Spore
5. Sucker - Bignonia

Answers:

Choose the best answers:

1. Bryophyllum 2. Budding 3. Flower 4. Wind, Water and Insects 5. Betel and Black pepper

Fill in the blanks:

1. Androecium 2. Ovary 3. Seed 4. Avicennia 5. Bulb

State True or False:

1. True
2. True
3. True
4. False

Correct Statement: Ginger is an underground modified stem which has nodes and internodes.

5. True

Match the following:

1. Attracts insects 2. Spore 3. Opuntia 4. Bignonia 5. Chrysanthemum

7th Science Lesson 6

6] Health And Hygiene

Do You Know?

Dengue is spread by mosquitoes of *Aedes aegypti* caused by DEN-1, 2 viruses belonging to the type – flavi virus. It decrease counting of the blood platelets of human blood and it has a maximum flight range of 50 – 100 metres in and around the places.

Vaccine: A vaccine is a biological preparation that provides active acquired immunity to a particular disease. Vaccines like (BCG, Polio, MMR) are given at early child wood to protect from other diseases.

Leucoderma is a non-communicable diseases caused by partial or total loss of pigmentation in the skin (melanin pigment). This condition affects any age, gender and ethnicity. There is no cure. It does not spread by touching, sharing food and sitting together.

As a general rule, iron supplements should be given orally, not to be injected, because it leads to dangerous.

Choose the best answers:

1. Ravi has sound mind and physically fit body. This refers to

- (a) Hygiene
- (b) Health
- (c) Cleanliness
- (d) Wealth

2. Sleep is not only good for body, but it is also good for

- (a) Enjoyment
- (b) Relaxation
- (c) Mind
- (d) Environment

3. Our living place should be

- (a) Open
- (b) Closed
- (c) Clean
- (d) Unclean/untidy

4. The tobacco chewing causes

- (a) Anaemia
- (b) Periodontitis
- (c) Tuberculosis
- (d) Pneumonia

5. The first aid is to

- (a) To save money
- (b) To prevent scars
- (c) To prevent the medical care
- (d) To relive the pain

Fill in the blanks:

1. A group of people living together in a particular area is called _____
2. I am green colour box with garbage. Who am I? _____
3. Eyes are considered as _____ to the world.
4. The hair follicles produce _____ which keeps the hair smooth.
5. Tuberculosis is caused by the bacterium _____

State true or false. If false, correct the statement:

1. All food should be covered.
2. Chicken pox also known as Leucoderma.
3. Stomach ulcer is a non-communicable disease.
4. Rabies is a fatal disease.
5. First – degree burns damage the whole skin.

Match the following:

1. Rabies - Salmonella
2. Cholera - Yellow Urine
3. Tuberculosis - Cramps in legs
4. Hepatitis - Hydrophobia
5. Typhoid - Mycobacterium

Complete the analogy:

1. First degree burn: epidermis :: second degree burn: _____
2. Typhoid: Bacteria :: Hepatitis: _____
3. Tuberculosis: air :: Cholera: _____

Consider the statements given below and choose the correct option:

1. Assertion (A) : Oral hygiene is good.

Reason (R) : Sound teeth and healthy gums with healthy surroundings tissues.

- (a) Both A and R is true
- (b) Both A and R is false
- (c) A is true but R is false
- (d) A is false but R is true

2. Assertion (A) : Chicken pox is a viral communicable disease.

Reason (R) : Characterized by rashes on the whole body, fever, head ache and tiredness.

- (a) Both A and R is true
- (b) Both A and R is false
- (c) A is true but R is false
- (d) A is false but R is true

Answers:**Choose the best answers:**

1. Health 2. Mind 3. Clean 4. Periodontitis 5. To relieve the pain

Fill in the blanks:

1. Community 2. Degradable dust bin 3. Windows 4. Oil 5. Mycobacterium Tuberculae

Say True or False:

- 1. True
- 2. False

Correct Statement: Chicken pox is also known as varicella.

- 3. True
- 4. True
- 5. False

Correct Statement: First degree burns only damages the outer layer (epidermis) of the skin.

Match the following:

1. Hydrophobia 2. Cramps in legs 3. Mycobacterium 4. Yellow Urine 5. Salmonella

Complete the analogy:

1. Dermis 2. Virus 3. Water

Consider the statements given below and choose the correct option:

- 1. Both the Assertion and Reason is true.
- 2. Both the Assertion and Reason is true.

7th Science Lesson 7**7] Visual Communications****Choose the best answers:**

- 1. Which is the example for animation?
- (a) Sound communication

(b) Visual communication

(c) Vector communication

(d) Raster communication

2. Who uses the Photoshop software more?

(a) Teacher

(b) Doctor

(c) Painter

(d) Photographer

3. Which option is used in the Microsoft Photo story to upload the photos?

(a) Begin a Story

(b) Import Pictures

(c) Settings

(d) View your story

4. Which technology shows the computer-drawn pictures as real picture?

(a) Ink scape

(b) Photo Story

(c) Virtual Reality

(d) Adobe Illustrator

5. Which technology uses pixels to create pictures?

(a) Vector

(b) Raster

(c) Both

(d) None

6. Which software is used to create symbols?

(a) Photoshop

(b) Illustrator

(c) Vector Graphics

(d) Photo story

Match the following:

1. Animations - 3D

2. Raster - Visual Communication

3. Vector - Pixels

4. Virtual Reality - Microsoft Photo story

5. Video Story - Illustrator

Answers:**Choose the best answers:**

1. Raster communication 2. Photographer 3. Begin a story 4. Virtual reality 5. Pixels 6. Vector Graphics

Match the following:

1. Visual Communication 2. Pixels 3. Illustrator 4. 3D 5. Microsoft Photo story

7th Science Lesson 8**8] Heat And Temperature****Do You Know?**

In humans, the average internal temperature is 37°C (98.6°F), though it varies among individuals. However, no person always has exactly the same temperature at every moment of the day. Temperatures cycle regularly up and down through the day according to activities and external factors.

Maximum – minimum thermometer: The maximum and minimum temperatures of the previous day reported in weather reports are measured by a thermometer called the maximum – minimum thermometer.

Most of the people in the world use the Celsius scale to measure temperature for day to day purpose. The Kelvin scale has been designed in such a way, it is not only an absolute temperature scale, but also 1°C change is equal to a 1 K change. This makes the conversion from Celsius to absolute temperature scale (Kelvin scale) easy, just the addition or subtraction of a constant 273.15. But in United States they prefer to use the Fahrenheit scale. The problem is, converting Fahrenheit to absolute scale (Kelvin) is not easy. To sort out this problem they use the Rankine scale. It named after the Glasgow University engineer and physicist Rankine, who proposed it in 1859. It is an absolute temperature scale, and has the property of having a 1°R change is equal to a 1°F change. Fahrenheit users who need to work with absolute temperature can be converted to Rankine by $R = F + 459.67$.

Choose the best answers:

1. International unit of measuring temperature is _____

(a) Kelvin

(b) Fahrenheit

(c) Celsius

(d) Joule

2. In thermometer when bulb comes in contact with hot object, liquid inside it

(a) Expands

(b) Contracts

(c) Remains same

(d) None of above

3. The body temperature of a healthy man is

(a) 0°C

(b) 37°C

(c) 98°C

(d) 100°C

4. Mercury is often used in laboratory thermometers because it _____

(a) Is a harmless liquid

(b) Is silvery in colour and is attractive in appearance

(c) Expands uniformly

(d) Is a low cost liquid

5. Which of the following temperature conversions is incorrect $K \text{ (Kelvin)} = ^\circ C \text{ (Celsius)} + 273.15$

°C K

(a) -273.15 0

(b) -123 +150.15

(c) +127 +400.15

(d) +450 +733.15

Fill in the blanks:

1. Doctor uses _____ thermometer to measure the human body temperature.

2. At room temperature Mercury is in _____ state.

3. Heat energy transfer from _____ to _____

4. -7°C temperature is _____ than 0°C temperature.

5. The common laboratory thermometer is a _____ thermometer.

Match the following:

i) Clinical thermometer - A form of energy

ii) Normal temperature of human body - 100°C

iii) Heat - 37°C

iv) Boiling point of water - 0°C

v) Melting point of water - Kink

Answers:**Choose the correct answers:**

1. Kelvin 2. Expands 3. 37°C 4. Expands uniformly 5. +450 °C +733.15K

Fill in the blanks:

1. Clinical 2. Liquid 3. Higher temperature region to Lower temperature region 4. Less 5. Mercury

Match the following:

1. Kink 2. 37°C 3. A form of energy 4. 100°C 5. 0°C

7th Science Lesson 9**9] Electricity****Do You Know?**

Conventional current is in the direction opposite to electron flow.

The potential difference between any two points in the circuit is the amount of energy needed to move one unit of electric charge from one point to the other.

1 milli ampere (mA) = 10^{-3} ampere = 1/1000 ampere

1 microampere (μ A) = 10^{-6} ampere = 1/1000000 ampere

The electric current flow from the higher potential level to the lower potential level is just like the water flow.

An electric cell is something that provides electricity to different devices that are not fed directly or easily by the supply of electricity.

The dry cell is not really dry in nature but the quantity of water in it is very small, as the electrolyte is in the form of a paste. In other cells, the electrolyte is usually a solution.

Electrolytes are substances that become ions in solution and acquire the capacity to conduct electricity.

All muscles of our bodies move in response to electrical impulses generated naturally in our bodies.

Short circuit: You might have observed the spark in the electric pole located nearby your house. Do you know the cause of this electric spark? This is due to the short circuiting of electricity along its path. A short circuit is simply a low resistance connection between the two conductors supplying electrical power to any circuit. Arc welding is a common example of the practical application of the heating due to a short circuit.

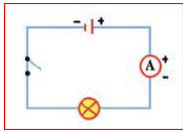
This is the material used in SIM cards, Computers and ATM cards. Do you know by which material I am made up of? The chip which is used in SIM cards, Computers and ATM cards are made up of semiconductors namely, silicon and germanium because of their electrical conductivity lies between a conductor and an insulator.

Wires made of copper, an electrical conductor, have very low resistance. Copper wires are used to carry current in households. These wires are in turn enclosed in electrical insulators, or materials of high electrical resistance. These materials are usually made of flexible plastic.

Generation of heat due to electric current is known as the heating effect of electricity.

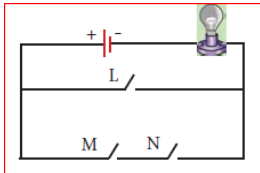
Choose the best answers:

1. In the circuit diagram below, 10 units of electric charge move past point x every second. What is the current in the circuit?



- (a) 10 A
- (b) 1 A
- (c) 10 V
- (d) 1 V

2. In the circuit shown, which switches (L, M or N) must be closed to light up the bulb?

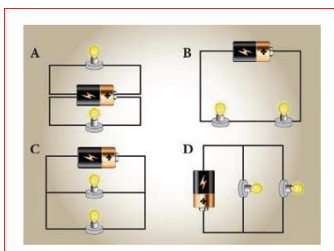


- (a) Switch L only
- (b) Switch M only
- (c) Switch M and L only
- (d) Either switch L or switches M and N

3. Small amounts of electrical current are measured in milli-ampere (mA). How many milli-ampere are there in 0.25 A?

- (a) 2.5 mA
- (b) 25 mA
- (c) 250 mA
- (d) 2500 mA

4. In which of the following circuits are the bulb connected in series?



Fill in the blanks:

1. The direction of conventional current is _____ to electron flow.
2. One unit of coulomb is charge of approximately _____ protons or electrons.
3. _____ is used to measure the electric current.
4. In conducting materials electrons are _____ bounded with atoms.
5. S.I. unit of Electrical conductivity of a conductor is _____

State true or false. If false, correct the statement:

1. Electron flow in the same direction to conventional current flow.
2. The fuse wire does not melt whenever there is overload in the wiring.
3. In a parallel circuit, the electric components are divided into branches.
4. The representation of the electric current is A.
5. The electrical conductivity of the semiconductor is in between a conductor and an insulator.

Match the following:

1. Cell - used to open or close a circuit
2. Switch - safety devices used in electric circuit
3. Circuit - a complete path for the flow of an electric current
4. Miniature circuit breaker - reset by hand, circuit becomes complete once again
5. Fuse - a device which converts chemical energy into electrical energy

Complete the analogy:

1. Water: pipe :: Electric current: _____
2. Copper: conductor :: Wood: _____
3. Length: metre scale :: Current: _____
4. Milli ampere: micro ampere :: 10^{-3} A: _____

Consider the statements given below and choose the correct option:

1. Assertion (A) : Copper is used to make electric wires.
Reason (R) : Copper has very low electrical resistance.
(a) Both A and R is true and R is the correct explanation of A
(b) Both A and R are true but R is N not the correct explanation of A
(c) A is true but R is false
(d) A is false but R is true
(e) Both A and R is false

2. Assertion (A) : Insulators do not allow the flow of current through themselves.

Reason (R) : They have no free charge carriers.

- (a) If both A and R are true and R is the correct explanation of A
- (b) If both A and R are true but R is N not the correct explanation of A
- (c) If A is true but R is false
- (d) If both A and R are false

Answers:

Choose the correct answers:

1. 10A 2. Either switch L or switches M and N 3. 250mA 4. Circuit D

Fill in the blanks:

1. Opposite 2. 6.242×10^{18} 3. Ammeter 4. Loosely 5. Siemens/metre(S/m)

State True or False:

1. False

Correct Statement: Electron flow is in the opposite direction to the conventional current flow.

2. False

Correct Statement: The fuse wire melts whenever there is overload in the wiring.

3. True

4. False

Correct Statement: The representation of the electric current is I.

5. True

Match the following:

- 1. A device which converts chemical energy into electrical energy
- 2. Used to open or close a circuit
- 3. A complete path for the flow of an electric current
- 4. Reset by hand, circuit becomes complete once again
- 5. Safety devices used in electric circuit

Complete the analogy:

1. Wire 2. Insulator 3. Ammeter 4. 10^{-6} A

Consider the statements given below and choose the correct option:

- 1. Both A and R is true and R is the correct explanation of A
- 2. Both A and R is true and R is the correct explanation of A

7th Science Lesson 10

10] Changes Around Us

Do You Know?

Another way of preventing rusting is to deposit a layer of a metal like chromium or zinc on iron. This is called galvanization and you will learn about this detail in higher classes.

The Iron Pillar at Delhi: Amazingly there is an iron that did not rust! There is an iron pillar at the Qutub complex in Delhi which is more than 1600 years old. Even after such a long period, the iron pillar kept in open spaces has not rusted at all. This shows that Indian scientists made great advances in metal making technology even at 16th century which enabled them to make this iron pillar having the quality of great rust resistance.

Louis Pasteur (1822 – 1895), a French chemist and microbiologist was the first person to describe the process of fermentation. He described that fermentation occurs in the absence of air and in the presence of micro organisms such as yeast. He discovered the cure for rabies.

Catalysts are substances that speed up the process of a chemical change and it will not undergo any change during the course of the reaction. For example, yeast acts as the catalyst in the fermentation of sugar. You will learn more about catalyst in your higher classes.

Choose the best answers:

1. When a woollen yarn is knitted to get a sweater, the change can be classified as _____

- (a) Physical change
- (b) Chemical change
- (c) Endothermic change
- (d) Exothermic change

2. _____ of the following are endothermic changes.

- (a) Condensation and melting
- (b) Condensation and freezing
- (c) Evaporation and melting
- (d) Evaporation and freezing

3. The chemical change is _____

- (a) Water to clouds
- (b) Growth of a tree
- (c) Cow dung to bio-gas
- (d) Ice-cream to molten ice-cream

4. _____ is an example of a periodic change.

- (a) Earthquake

(b) Formation of rainbow in sky

(c) Occurrence of tides in seas

(d) Showering of rain

5. _____ is not a chemical change.

(a) Dissolution of ammonia in water

(b) Dissolution of carbon-di-oxide in water

(c) Dissolution of oxygen in water

(d) Melting of polar ice caps

Fill in the blanks:

1. Filling up a balloon with hot air is a _____ change.

2. Stretching gold coin into a ring is a _____ change.

3. Opening a gas cylinder knob converts _____ fuel into _____ fuel. This is an example of _____ change.

4. Spoiling of food is a _____ change.

5. Respiration is a _____ change.

State true or false. If false, correct the statement:

1. Cutting of cloth is an example of a periodic change.

2. Taking a glass of water and freezing it by placing it in the freezer is a chemical change.

3. A bean plant collecting sunlight and turning it into bean seeds is an example of physical and non-periodic change.

4. If the chemical properties of a substance remain unchanged and the appearance or shape of a substance changes it is called a periodic change.

5. Tarnishing of silver is an example of endothermic change.

Match the following:

A	B	C
Melting	Change of state from liquid to solid	Ticking of clock
Condensation	Change of state from liquid to gas	Formation of ice cube
Evaporation	Change of state from solid to liquid	Collecting flowers
Freezing	Change of state from gas to liquid	Ice cube to water
Periodic change	Occurs at irregular time intervals	Water to steam
Non-periodic change	Occurs at regular time intervals	Steam to water drops

Complete the analogy:

1. Physical Change: Boiling :: Chemical change: _____
2. Wood to saw dust: _____ :: Wood to Ash: Chemical change.
3. Forest fire: _____ change :: Change in period in a school: period change.

Consider the statements given below and choose the correct option:

1. Assertion: The explosion of fire cracker is a physical change.

Reason: A physical change is a reversible change.

- (a) Both A and R is true and R is the correct explanation of A
- (b) Both A and R are true but R is N not the correct explanation of A
- (c) A is true but R is false
- (d) A is false but R is true

2. Assertion: The process of conversion of liquid water to its vapours by heating the liquid is called boiling.

Reason: The process of conversion of water vapours to liquid by cooling the vapours is called condensation.

- (a) Both A and R is true and R is the correct explanation of A
- (b) Both A and R is true but R is not the correct explanation of A
- (c) A is true but R is false
- (d) A is false but R is true

3. Assertion: Burning of wood log to charcoal is a physical change.

Reason: The products formed of burning a piece of wood can be easily converted back to wood log.

- (a) Both A and R is true and R is the correct explanation of A
- (b) Both A and R are true but R is N not the correct explanation of A
- (c) A is true but R is false
- (d) Both A and R is false

4. Assertion: The formation of iron oxide from iron is a chemical change.

Reason: For the rust to form from iron, it must be exposed to air and water.

- (a) Both A and R is true and R is the correct explanation of A
- (b) Both A and R is true but R is not the correct explanation of A
- (c) A is true but R is false
- (d) A is false but R is true

5. Assertion: A drop of petrol when touched with finger gives a chill feeling.

Reason: The above phenomenon is an endothermic one.

- (a) Both A and R is true and R is the correct explanation of A
- (b) Both A and R is true but R is not the correct explanation of A
- (c) A is true but R is false
- (d) A is false but R is true

Answers:

Choose the correct answers:

1. Physical change 2. Condensation and melting 3. Cow dung to bio-gas 4. Occurrence of tides in seas
5. Dissolution of carbon-di-oxide in water

Fill in the blanks:

1. Physical 2. Physical 3. Liquid, Gaseous, Chemical 4. Chemical 5. Exothermic chemical

State True or False:

1. False

Correct Statement: Cutting of cloth is an example of a physical change

2. False

Correct Statement: Taking a glass of water and freezing it by placing it in the freezer is a physical change

3. False

Correct Statement: A bean plant collecting sunlight and turning it into bean seeds is an example of chemical and non – periodic change.

4. False

Correct Statement: If the chemical properties of a substance remain unchanged and the appearance or shape of a substance changes it is called a physical change.

5. False

Correct Statement: Tarnishing silver is an example of chemical change.

Match the following:

- 1. Melting: Change of state from solid to liquid: Ice cube to water
- 2. Condensation: Change of state from gas to liquid: Steam to water drops
- 3. Evaporation: Change of state from liquid to gas: Water to steam
- 4. Freezing: Change of state from liquid to solid: Formation of ice cube
- 5. Periodic change: Occurs at regular time intervals: Ticking of clock
- 6. Non-periodic change: Occurs at irregular time intervals: Collecting flowers

Complete the analogy:

1. Burning 2. Physical change 3. Non-periodic

Consider the statements given below and choose the correct option:

1. A is true but R is false
2. Both A and R is true but R is not the correct explanation of A
3. Both A and R is false.
4. Both A and R is true and R is the correct explanation of A
5. Both A and R is true and R is the correct explanation of A

7th Science Lesson 11

11] Cell Biology

Do You Know?

Stem Cells: Stem cells are quite amazing as they can divide and multiply while at the same time with their ability to develop into any other type of cell. Embryonic stem cells are very special as they can become absolutely any type of cells in the body, for example, blood cell, nerve cell, muscle cell or gland cell. So they are utilized by the Scientist and Medicos, to cure and prevent some diseases like Spinal cord injury.

Various ranges of these plastids impart different colours to various parts of plant. Chromoplast impart colour to flower and fruits. As fruit ripen, chloroplasts change to chloroplasts. Starch is converted to sugar.

Red blood cells: Red blood cells do not contain a nucleus. Without a nucleus, these cells die quickly; about two million red blood cells die every second! Luckily, the body produces new red blood cells every day.

Choose the best answers:

1. Basis unit of life
 - (a) Cell
 - (b) Protoplasm
 - (c) Cellulose
 - (d) Nucleus
2. I am the outer most layer of an animal cell. Who am I?
 - (a) Cell wall
 - (b) Nucleus
 - (c) Cell membrane
 - (d) Nuclear membrane
3. Which part of the cell is called the brain of the cell?
 - (a) Lysosome
 - (b) Ribosome
 - (c) Mitochondria
 - (d) Nucleus

4. _____ helps in cell division.

- (a) Endoplasmic reticulum
- (b) Golgi complex
- (c) Centriole
- (d) Nucleus

5. Suitable term for the various components of cell is _____

- (a) Tissue
- (b) Nucleus
- (c) Cell
- (d) Cell organelle

Fill in the blanks:

1. The jelly like substance present in the cell is called _____
2. I convert the Sun's energy into food for the plant. Who am I? _____
3. Mature Red blood cell do not contain a _____
4. Unicellular organisms can only be seen under a _____
5. Cytoplasm plus nucleoplasm is equal to _____

State true or false. If false, correct the statement:

1. Animal cells have a cell wall.
2. Salmonella is a unicellular bacterium.
3. Cell membrane is fully permeable.
4. Only plant cells have chloroplasts.
5. Human stomach is an organ.
6. Ribosomes are small organelles with a membrane.

Match the following:

1. Transporting channel - Nucleus
2. Suicidal bag - Endoplasmic reticulum
3. Control room - Lysosome
4. Power house - Chloroplast
5. Food producer - Mitochondria

Complete the analogy:

1. Bacteria: microorganism :: mango tree: _____

2. Adipose: tissue :: eye: _____

3. Cell wall: plant cell :: centriole: _____

4. Chloroplast: photosynthesis :: mitochondria: _____

Consider the statements given below and choose the correct option:

1. Assertion (A) : Tissue is a group of dissimilar cells.

Reason (R) : Muscle is made up of Muscle cell.

(a) Both A and R is true

(b) Both A and R is false

(c) A is true but R is false

(d) A is false but R is true

2. Assertion (A) : Majority of cells cannot be seen directly with naked eye because.

Reason (R) : Cells are microscopic.

(a) Both A and R is true

(b) Both A and R is false

(c) A is true but R is false

(d) A is false but R is true

Answers:

Choose the correct statements:

1. Cell 2. Cell membrane 3. Nucleus 4. Centriole 5. Cell Organelle

Fill in the blanks:

1. Cytoplasm 2. Chloroplast 3. Nucleus 4. Microscope 5. Protoplasm

Match the following:

1. Endoplasmic reticulum 2. Lysosome 3. Nucleus 4. Mitochondria 5. Chloroplast

Complete the Analogy:

1. Macro-organism 2. Organ 3. Animal Cell 4. Respiration

Consider the statements given below and choose the correct option:

1. Both A and R is true

2. Both A and R is true

12] Basis Of Classification

Do You Know?

Aristotle was a Greek philosopher and thinker who lived about 2400 years ago. Aristotle came up with the following grouping system that was used for almost 2000 years after his death! He classified all organisms into either animals or plants. Then the classified into those 'with blood' and those 'without blood'. Then the animals are classified into three groups based on their method of movement: walker, flyers or swimmers.

Scientific Names of Some Organisms:

S.No	Common Name	Scientific Name
1	Human being	Homo sapiens
2	Onion	Allium sativum
3	Rat	Rattus rattus
4	Pigeon	Columba livia
5	Tamarind	Tamirindus indica
6	Lime	Citrus aurantifolia
7	Neem tree	Azardirachta indica
8	Frog	Rana hexadactyla
9	Coconut	Cocos nucifera
10	Paddy	Oryza sativa
11	Fish	Catla catla
12	Orange	Citrus sinensis
13	Ginger	Zingiber officinale
14	Papaya	Carica papaya
15	Date	Phoenix dactylifera

Choose the best answers:

1. The following characteristics are essential for classification.

- (a) Similarities
- (b) Differences
- (c) Both of them
- (d) None of them

2. Approximately _____ species of living organisms found in the earth.

- (a) 8.7 million

(b) 8.6 million

(c) 8.5 million

(d) 8.8 million

3. The largest division of the living world is _____

(a) Order

(b) Kingdom

(c) Phylum

(d) Family

4. Who proposed the five kingdom of classification?

(a) Aristotle

(b) Linnaeus

(c) Whittaker

(d) Plato

5. The binomial name of pigeon is _____

(a) Homo sapiens

(b) Rattus rattus

(c) Mangifera indica

(d) Columbo livia

Fill in the blanks:

1. _____ in 1623, introduced the binomial nomenclature.

2. Species is the _____ unit of classification.

3. _____ are non-green and non-photosynthetic in nature.

4. The binomial name of onion is _____

5. Carolus Linnaeus is known as the Father of _____

State true or false. If false, correct the statement:

1. Classification helps to know the origin and evolution of an organism.

2. Fishes are aquatic vertebrates.

3. In the year 1979, five kingdom classifications were proposed.

4. True nucleus is seen in prokaryotic cell.

5. Animal cells have cell wall.

Match the following:

1. Monera - Moulds
2. Protista - Bacteria
3. Fungi - Neem
4. Plantae - Butterfly
5. Animalia - Euglena

Consider the statements given below and choose the correct option:

1. Assertion: Binomial name is the universal name and contains two names.

Reason: It was first introduced by Carolus Linnaeus.

- (a) Assertion is correct, Reasoning is correct
- (b) Assertion is correct, Reasoning is incorrect
- (c) Assertion is incorrect Reasoning is correct
- (d) Assertion and Reasoning are incorrect

2. Assertion: Identification, assortment and grouping are essential for classification.

Reason: These are basic steps of taxonomy.

- (a) Assertion is correct, Reasoning is correct
- (b) Assertion is correct, Reasoning is incorrect
- (c) Assertion is incorrect Reasoning is correct
- (d) Assertion and Reasoning are incorrect

Answers:**Choose the best answers:**

1. Similarities and Differences 2. 8.7 million 3. Kingdom 4. Whittaker 5. Columbo livia

Fill in the blanks:

1. Gaspard Bauhin 2. Basic 3. Fungi 4. Allium Sativum 5. Modern Taxonomy

Say True or False:

1. True
2. True
3. False

Correct Statement: In the year 1969, five kingdom classifications were proposed.

4. False

Correct Statement: True cells are seen in eukaryotic cell.

5. False

Correct Statement: Plant cells have cell wall.

Match the following:

1. Bacteria 2. Euglena 3. Moulds 4. Neem 5. Butterfly

Consider the statements given below and choose the correct option:

1. Assertion is correct, Reasoning is incorrect
2. Assertion is correct, Reasoning is correct

7th Science Lesson 13

13] Digital Painting

Choose the best answers:

1. Tux paint software is used to _____

- (a) Paint
- (b) Program
- (c) Scan
- (d) PDF

2. Which toolbar is used for drawing and editing controls in tux paint software?

- (a) Left side: Toolbar
- (b) Right side: Toolbar
- (c) Middle: Toolbar
- (d) Bottom: Toolbar

3. What is the shortcut key for undo option?

- (a) Ctrl + Z
- (b) Ctrl + R
- (c) Ctrl + Y
- (d) Ctrl + N

4. Tux Math software helps in learning the _____

- (a) Painting
- (b) Arithmetic
- (c) Programming

(d) Graphics

5. In Tux Math, Space cadet option is used for _____

(a) Simple addition

(b) Division

(c) Drawing

(d) Multiplication

Answers:**Choose the best answers:**

1. Paint 2. Left side: Toolbar 3. Ctrl + Z 4. Arithmetic 5. Simple addition

7th Science Lesson 14**14] Light****Do You Know?**

Light is the only source of energy for plants. So, they entirely depend on light. People and animals derive energy from carbohydrates, protein and fat through their food. Plants produce food using the energy from Sun light, carbon-di-oxide and water by the process called as Photosynthesis. Sun light acts a vital role in the process of photosynthesis.

Is the moon a luminous object? The moon provides light as well, but it cannot produce light by its own. The light emitted by the Moon is the light of the Sun reflected towards the Earth. When we see the Moon, we see only the Moon's lighted part. Thus, half of the moon is always facing the Sun and receiving light from it. Hence, we receive light from the moon.

We often use a kind of gas-discharge lamp that uses fluorescence to produce visible light. The electric current in the gas excites mercury vapour, which produces short-wave ultraviolet light that then causes a phosphor coating on the inside of the lamp to glow in visible light.

Al-hasan-Haytham was a scientific thinker who made important contribution to the understanding of vision, optics and light. He observed that light coming through a tiny hole travelled in straight lines and projected an image onto the opposite wall. Based on such experimentation, he concluded that vision is accomplished by rays coming from external luminous sources and entering the eye, rather than through rays emitted from the eye as was then commonly believed. He is the first one to experiment with light and found important properties like the rectilinear propagation of light.

Before the advancement of camera, Pinhole camera was used to photograph movement of the sun over a long period of time. This type of photography is known as solography and also be used for observing and recording solar eclipses. And it was also used to take photograph of stationary objects.

Optical fibre is a device that works on the principle of total internal reflection by which light signals (huge data) can be transmitted from one place to another place with a negligible loss of energy in a very short time. It consists of a cable having one or more thin flexible fibres with a glass core through which light signals can be sent. Optical fibre can be twisted and bent easily. When a light ray of light is incident at one end of the core of optical fibre, it suffers total internal reflection at the many places inside the fibre and emerges at the other end with negligible loss of energy. The data or information in the form of pulses of light can be sent through bundles of optical fibres. Optical fibres have become very important in high-speed communications, such as cable TV and high-speed broadband services. Fibre optic cables are able to carry more signals than traditional copper cable telephone lines.

Why is the word "AMBULANCE" written backwards in ambulance vehicle? This is due to lateral inversion. The phenomenon due to which the left side of an object appears to be right side of the object in its image in a reflecting medium (mirror) so that drivers see the word the right way around in their rear-view mirror.

Why danger lights in vehicles are red in colour? Red colour is scattered the least by air molecules. Red colour has the highest wavelength of all the other colours. So red colour is able to travel the longest distance through air, fog.

Choose the best answers:

1. Light travels only in a _____. It is because of this property that _____ are formed

- (a) Curved line, shadows
- (b) Straight line, shadows
- (c) Straight line, reflection
- (d) Curved line and then straight line, shadows

2. Light that hits a mirror gets _____

- (a) Transmitted
- (b) Reflected
- (c) Absorbed
- (d) Refracted

3. _____ surface reflects the light well.

- (a) Water
- (b) Compact disc
- (c) Mirror
- (d) Stone

4. Light is a form of _____

- (a) Matter
- (b) Energy
- (c) Medium
- (d) Particle

5. You can see your image in polished floors, but not in wooden table because _____

- (a) Regular reflection takes place in wooden table and irregular reflection in polished floor
- (b) Regular reflection takes place in polished floor and irregular reflection in wooden table
- (c) Regular reflection takes place in both polished floor and wooden table
- (d) Irregular reflection takes place in both polished floor and wooden table

6. Choose the translucent substance from the following

- (a) Glass

(b) Wood

(c) Water

(d) Clouds

7. Reflection occurs, when the light

(a) About to reach a surface

(b) Approaches a surface

(c) Passes through a surface

(d) None of these

8. Which of the following is the best reflector of light?

(a) Plastic plate

(b) Plane mirror

(c) Wall

(d) Paper

9. Sivarajan placed a metre stick in the playground at 7.00 am in the morning. How will the shadow of the stick at noon look in comparison to the one in the morning?

(a) There will be no shadow

(b) The shadow will be longer and on the opposite side as the sun

(c) The shadow will be shorter and on the same side as the sun

(d) The shadow will be shorter

10. The image formed by a pinhole camera is inverted because,

(a) Light travels in straight lines

(b) Light rays become laterally inverted as they pass through a pinhole camera

(c) Light rays pass through the pinhole

(d) Light rays get reflected

11. Which of the following facts explain how shadows are formed?

(a) Light travels in straight lines

(b) Opaque bodies do not allow light to pass through them

(c) Reflection occurs at smooth surfaces like mirrors

(d) Lateral inversions happens

(i) Both A and B

(ii) Both A and D

(iii) Both B and C

(iv) Only A

Fill in the blanks:

1. A plane mirror produces an _____ image.
2. A _____ reflection helps us to see the objects.
3. The light ray gets _____ when it falls on any polished surface.
4. Sunlight is a blend of _____ colours.
5. The splitting of white light in to seven colours is called _____.
6. The moon _____ sun light.
7. The sunlight can be split into its constituent colours using _____.
8. Reflection of light from rough surface is called _____ reflection.

State true or false. If false, correct the statement:

1. The image of right hand in a plane mirror looks like a left hand.
2. Rainbow is formed by dispersion of which light by water drops.
3. The image formed by the plane mirror is laterally inverted; hence the image seen through the periscope is also laterally inverted.
4. We see planets because they reflect light from the sun.
5. We see a book because it reflects the light that falls on its surface.
6. The image formed in a pinhole camera is always inverted.
7. The image formed in a pinhole camera is always the same size as the object.
8. The image formed in a plane mirror is upside down.
9. A plane mirror is opaque.
10. A shadow is formed on the same side of the object as the source of light.
11. We are able to see things around us with the help of regular reflection.
12. After passing through a prism, white light splits into a band of seven colours.

Match the following:

1. Rectilinear propagation - Primary source of light
2. Plane Mirror - Non-luminous object
3. Fire fly - Periscope
4. The Moon - Pinhole camera
5. Wide light source - Spectrum of light
6. Regular reflection - Luminous object
7. The sun - Penumbra
8. Band of seven colours - Glossy surface

Answers:

Choose the best answers:

1. Straight line, reflection 2. Reflected 3. Mirror 4. Energy
5. Regular reflection takes place in polished floor and irregular reflection in wooden table
6. Clouds 7. Passes through a surface 8. Plane mirror 9. The shadow will be shorter
10. Light travels in straight line 11. Both A and B

Fill in the blanks:

1. Virtual 2. Light 3. Reflected 4. Seven 5. Dispersion 6. Reflects 7. Prism 8. Diffuse

State true or false:

1. True
2. True
3. True
4. True
5. True
6. True
7. False

Correct Statement: The image formed by the pin hole camera is always smaller than the object size.

8. False

Correct Statement: The image formed in a plane mirror is virtual image of same size.

9. True
10. False

Correct Statement: A Shadow is always formed on against the opposite side of the light source.

11. True
12. True

Match the following:

1. Penumbra 2. Pinhole camera 3. Non-luminous object 4. Primary source of light 5. Glossy surface 6. Periscope
7. Spectrum of light 8. Luminous object

7th Science Lesson 15**15] Universe And Space****Do You Know?**

Astronomical unit: The average distance between the Earth and the Sun is called an astronomical unit. It is denoted by 'au'. $1 \text{ au} = 1.496 \times 10^8 \text{ km}$

Light year: The distance travelled by light in one year is called a light year. It is denoted by 'ly'. $1 \text{ ly} = 9.4607 \times 10^{12} \text{ km}$

Parsec: A parsec is defined as the distance at which one astronomical unit subtends an angle of one arc second. It is denoted by 'pc'. $1 \text{ pc} = 3.2615 \text{ ly} = 3.09 \times 10^{13} \text{ km}$

The Hubble Space Telescope and powerful ground-based telescopes are now beginning to find galaxies that were created about one billion years after the Big Bang. These small galaxies were much closer together than galaxies are today. Collisions were common. Like two flames moving towards each other, they merged into bigger galaxies. Our Milky Way galaxy came together in this way.

Subrahmanyan Chandrasekhar (19 October 1910 – 21 August 1995) was an Indian American astrophysicist who spent his professional life in the United States. He was awarded the 1983 Nobel Prize for Physics with William A Fowler. His mathematical treatment of stellar evolution yielded many of the best current theoretical models of the later evolutionary stages of massive stars and black holes. The Chandrasekhar limit is named after him. Chandrasekhar worked on a wide variety of physical problems in his lifetime.

In 1989, Galileo Galilei was memorialized with the launch of a Jupiter-bound space probe bearing his name. During its 14-years voyage, the Galileo space probe and its detachable mini-probe, visited Venus, the asteroid Gaspra, observed the impact of Comet Shoemaker-Levy 9 on Jupiter, Europa, Callisto, IO and Amalthea. In order to avoid the possible contamination of one of Jupiter's moons, the Galileo space probe was purposely crashed into Jupiter at the end of its mission in September 2003.

Choose the best answers:

1. The moon takes _____ days to complete one revolution around the Earth.

- (a) 25
- (b) 26
- (c) 27
- (d) 28

2. If the Moon is appearing in the sky today near the star Karthikai, the position of the Moon after 27 days is near the star

- (a) Bharani
- (b) Karthikai
- (c) Rohini
- (d) Asvini

3. Telescope was invented by

- (a) Han Lippershey
- (b) Galilio
- (c) Nicolus Copernicus
- (d) Ptolemy

4. The galaxy containing young and hot stars is

- (a) Elliptical galaxy
- (b) Irregular galaxy
- (c) Cluster
- (d) Spiral galaxy

5. With the launch of this satellite, ISRO became capable of launching 4 ton heavy satellites.

- (a) GSAT – 13
- (b) GSAT – 14
- (c) GSAT – 17
- (d) Way par GSAT – 19

Fill in the blanks:

1. Waxing of moon means _____
2. Heliocentric model is proposed by _____
3. _____ is the prevailing model of Evolution of the Universe.
4. _____ is a large constellation which covers a large part of the sky.
5. _____ is the first satellite launched by India.

State true or false. If false, correct the statement:

1. On a full moon day, when the Sun is setting in the west, moon rises in the West.
2. The word crescent refers to the phases where the moon is less than half illuminated.
3. Galilio accepted the Geo-centric model.
4. Our Milky Way galaxy is identified as an elliptical galaxy.
5. The planet Venus in our solar system doesn't have a moon.

Match the following:

1. Rohini - GSLV – Mark III
2. GSAT – 14 - GSLV Mark III m1
3. GSAT – 19 - SLV – 3
4. Chandrayaan – 2 - PSLV – XL C25
5. Mangalyaan - GSLV – D5

Complete the analogy:

1. Older stars: elliptical galaxies: younger stars: _____
2. Nearest galaxy: Andromeda: Nearest star: _____

Very short answers:

1. The word _____ refers to the phases where the moon is less than half illuminated (crescent/gibbous)
2. _____ and _____ planets never appear in the mid-night sky.
3. Number of days taken by the Mars to orbit around the Sun.
4. In which phase does the size of the planet Venus is small?
5. The only evidence of the big bang theory is.

6. The galaxy which contains abundant amount of gas and dust is _____

7. Which country launched the world's first artificial launch vehicle?

Answers:

Choose the best answers:

1. 27 2. Karthikai 3. Han Lippershey 4. Spiral galaxy 5. Way par GSAT-19

Fill in the blanks:

1. Changing of Full Moon 2. Nicolaus Copernicus 3. Big bang theory 4. Ursa Major 5. Aryabhatta

Say True or False:

1. False

Correct Statement: On a full moon day when the Sun is setting in the west, the moon rises at the same time in the east.

2. True

3. False

Correct Statement: Galileo accepted the Sun-heliocentric theory of Copernicus.

4. False

Correct Statement: Our Milky Way galaxy is identified as a Spiral galaxy.

5. True

Match the following:

1. SLV-3 2. PSLV-XL C25 3. GSLV-Mark III 4. GSLV-D5 5. GSLV Mark III m1

Complete the Analogy:

1. Spiral galaxies 2. Proxima Centauri

Very Short Answers:

1. Crescent 2. Venus and Mercury 3. 687 days 4. Gibbous phase 5. Hubble's discovery

6. Spiral galaxy 7. The Soviet Union

7th Science Lesson 16

16] Polymer Chemistry

Do You Know?

Nylon is very strong and can be used for rock climbing! Nylon is a plastic polymer made chemical units called polyamides. Polyamides are made with monomers – hexamethylenediamine and adipic acid. Solid chips of these polyamides are melted and forced through a heated spinneret which has very, very tiny holes.

Synthetic fibres are made from the by-products of processing petroleum oil and gas. You will learn about fractional distillation of petroleum in your higher classes.

It is estimated that every year we use a trillion plastic carry bags (2 million a minute) around the world and out of which only 1 to 3% are recycled.

Plastic has been around for less than 200 years. Edmund Alexander Parkes was the creator of the first plastic called 'Parkesine'.

We have seen that synthetic clothes are made from plastic. Every time we wash synthetic clothes, small fibres called microfibers escape and end up in the soil, streams, rivers and oceans. Dangerous pollution called Persistent Organic Pollutants (POPs) floating in the ocean sticks to these small pieces of plastic making them toxic. Marine animals such as shrimp and fish often eat micro plastics, confusing them for their natural source of food. The toxins build up in these animals and move up the food chain and can end up in our bodies. Micro plastics can be found in the food we eat, the water we drink and the air we breathe.

A recipe for PLA a compostable plastic.

What you need.

- i) 1 tablespoon of corn starch.
- ii) 1 teaspoon of vegetable glycerine (available at the pharmacy)
- iii) 1 teaspoon of vinegar (5% acidity)
- iv) 4 Tablespoons of water.
- v) Cooking spoon
- vi) Cooking pot
- vii) Stove
- viii) Aluminium foil

Method: Mix the water with the starch in a cooking pot. Add the vinegar and the glycerine. Mix all the ingredients on medium heat. Make sure you continuously stir. The mixture should turn from liquid white into a clear gel. When it begins to bubble, then it is ready and should be taken off the stove. Spread the gel onto the aluminium foil. Let it cool down for one hour. You can then shape the material to form a cup or bowl. Let the article you made cool for another 24 hours before you try and use it.

Choose the best answers:

1. The first man-made fibre is _____

- (a) Nylon
- (b) Polyester
- (c) Rayon
- (d) Cotton

2. Which of the following is the strongest?

- (a) Rayon
- (b) Nylon
- (c) Acrylic
- (d) Polyester

3. When you place a natural fibre in a flame it _____

- (a) Melts
- (b) Burns
- (c) Gets nothing
- (d) Explodes

4. A synthetic fibre which has similar properties to wool is _____

(a) Nylon

(b) Polyester

(c) Acrylic

(d) PVC

5. A good application of plastic is the use of _____

(a) Blood bags

(b) Plastic cutlery

(c) Plastic straws

(d) Plastic carry bags

6. _____ is a non-biodegradable material.

(a) Paper

(b) A plastic bottle

(c) Cotton cloth

(d) Wool

7. PET is the acronym for _____

(a) Polyester

(b) Polyester and Terylene

(c) Polyethylene terephthalate

(d) Polyetheneterylene

Fill in the blanks:

1. _____ is an example of polyester fabric.

2. _____ are used to identify different types of plastics.

3. A _____ is a long chain made up of many repeated small units called monomers.

4. A natural fibre is called _____

5. A natural fibre obtained by boiling cocoons is called _____

State true or false. If false, correct the statement:

1. A lot of plastic pollutes our environment.

2. Refuse (avoid) is the best way to manage plastic.

3. It is good to wear clothes made of synthetic fibres while cooking.

4. Degradable plastics break down into tiny pieces called micro-plastics.

5. Cotton is a natural polymer.

Match the following:

A - B

1. Nylon - Thermoplastic
2. PVC - Thermosetting plastic
3. Bakelite - Fibre
4. Teflon - Wood pulp
5. Rayon - Non-stick cookware's

Arrange in sequence:

1. Mix water, starch, vinegar and glycerine in a cooking pot.
2. Let the article cool for 24 hours before we use it.
3. Shape material to form a cup or bowl.
4. Continuously mix on medium heat until the liquid turns clear.
5. When the liquid begins to bubble it is ready to be taken off the stove.
6. Spread the gel onto aluminium foil and cool.

Complete the analogy:

1. Cotton: natural: Polyester: _____
2. PLA spoon: compostable: Plastic spoon: _____
3. Nylon: melts on heating: Silk: _____

Consider the statements given below and choose the correct option:

1. A: Vegetable peels buried in the soil disappear within two weeks.
R: Vegetable peels are compostable.
2. A: It takes a very long time for nylon clothes to breakdown into microfibers but cotton clothes need only six months to decompose.
R: Nylon made out of petrochemicals is non-biodegradable.
3. A: It is good to avoid plastics.
R: Plastics end up polluting the environment.

Answers:**Choose the correct answers:**

1. Rayon 2. Nylon 3. Burns 4. Acrylic 5. Blood bags 6. A plastic material 7. Polyethylene terephthalate

Fill in the blanks:

1. PET water bottles, Soda bottles 2. Resin code 3. Polymer 4. Plant or animal fibres 5. Silk

Say True or False:

1. True
2. True
3. False

Correct Statement: Cotton clothes are good to wear while cooking. Synthetic fibres are not heat resistant and easily catch fire.

4. True

5. True

Match the following:

1. Thermosetting plastic 2. Fibre 3. Thermoplastic 4. Non-stick cookware's 5. Wood pulp

Arrange in sequence:

1. Mix water, starch, vinegar and glycerine in a cooking pot.
2. Continuously mix on medium heat until the liquid turns clear.
3. When the liquid begins to bubble it is ready to be taken off the stove.
4. Spread the gel onto aluminium foil and cool.
5. Shape material to form a cup or bowl.
6. Let the article cool for 24 hours before we use it.

Complete the Analogy:

1. Artificial 2. Non-Compostable 3. Transfer the heat

Consider the statements given below and choose the correct option:

1. Both A and R is correct and R is the correct explanation of A.
2. Both A and R is correct and R is the correct explanation of A.
3. Both A and R is correct and R is the correct explanation of A.

7th Science Lesson 17

17] Chemistry In Daily Life

Do You Know?

New ORS	Grams/Litre	%	New ORS	Mmol/litre
Sodium chloride	2.6	12.683	Sodium	75
Glucose, anhydrous	13.5	65.854	Chloride	65
Potassium chloride	1.5	7.317	Glucose, anhydrous	75
Trisodium citrate, dehydrate	2.9	14.146	Potassium	20
			Citrate	10
Total	20.5	100.0	Total Osmolarity	245

Antibiotics don't work for viruses like cold and the flu.

Anaesthetics: The first local anesthetic was cocaine was isolated from coca leaves by Albert Niemannin Germany, 1860.

Dettol Mixture of chloroxylenol and terpinol. Tincture Iodine + 2 to 3% alcohol – Water mixture. Soap, Iodoform, phenolic solutions, ethanol, Boric acid, are examples.

Natural antiseptics: Garlic, Turmeric, Aloe vera

Fire chemical reaction: Oxygen + Heat + Fuel = Fire.

A candle flame is caused by vapour burning above the candle. This burning vapour is hotter than the surrounding air and is therefore less dense. So, by the principle of convection, it “rises” so the flame is always upwards.

Choose the best answers:

1. A drug effective in the treatment of pneumonia, and bronchitis is _____

- (a) Streptomycin
- (b) Chloramphenicol
- (c) Penicillin
- (d) Sulpha guanidine

2. Aspirin is _____

- (a) Antibiotic
- (b) Antipyretic
- (c) Sedative
- (d) Psychedelic

3. _____ are that neutralize stomach acid.

- (a) Antacid
- (b) Antipyretic
- (c) Analgesic
- (d) Antihistamines

4. The lowest temperature at which a substance catches the fire is called its _____

- (a) Boiling point
- (b) Melting point
- (c) Critical temperature
- (d) Ignition temperature

5. Which is the hottest part in the flame of candle _____?

- (a) Blue
- (b) Yellow
- (c) Black
- (d) Wax part

Fill in the blanks:

1. Penicillin was first discovered by _____
2. World ORS Day is _____
3. Combustion is a chemical reaction in which and substance react with _____
4. In the presence of water, the ignition temperature of paper is _____
5. Fire produced by oil cannot be controlled by _____

State true or false. If false, correct the statement:

1. Antibiotics do work for viruses like cold.
2. Analgesics are the substances that lower the temperature during fever.
3. All fuels form flame.
4. Oxygen is necessary for combustion.
5. Burning wood and coal causes pollution of air.

Match the following:

1. Antipyretic - reduce pain
2. Analgesic - reduce body temperature
3. Antacid - spontaneous combustion
4. Phosphorus - ORS Solution
5. Carbon-di-oxide - leads to respiratory problem

Complete the analogy:

1. Inner zone of flame :: _____, outer zone of flame :: _____
2. Tincture :: _____, cistamine :: _____

Very short answer:

1. First viral disease detected in human being was: _____
2. _____, _____ are called greenhouse gases
3. Name a substance which can be used as an antiseptic as well as disinfectant?
4. What are the main constituents of Dettol?
5. Name the unit in which the calorific value of a fuel is expressed?
6. How many types of combustion are there?
7. What are the essential requirements for producing fire?

Answers:**Choose the correct answers:**

1. Penicillin 2. Antipyretic 3. Antacid 4. Ignition Temperature 5. Blue

Fill in the blanks:

1. Alexander Fleming 2. July 29 3. Oxygen 4. Constant 5. Water

Say True or False:

1. True

2. False

Correct Statement: Analgesics or Pain killers are the pain suppressing chemicals.

3. False

Correct Statement: Substances which vaporizes during burning produces flames.

4. True

5. True

Match the following:

1. Reduces body temperature 2. Reduce pain 3. ORS solution 4. Spontaneous combustion 5. Leads to respiratory problem

Complete the analogy:

1. Black, Blue 2. Antiseptic, Disinfectant

Short answers:

1. Yellow fever 2. Carbon dioxide, Methane, Nitrous oxide 3. Dettol 4. Mixture of chloroxylenol and terpinol 5. kJ/kg 6. Three

7. Fuel, Air and Heat

7th Science Lesson 18**18] Animals In Daily Life****Do You Know?**

Honey: Where from honey comes, or how it is produced? Have you seen a beehive where many bees are seen buzzing about? Bees collect nectar (sweet juices) from flowers, convert it into honey and store in their honey comb. Honey is a sweet liquid produced by honey bees from the nectar of flowers. It is extracted from beehives by us. Raw organic wild honey is extracted from selected hives by tribal honey hunters, who collect it from jungles. Honey has more medicinal values and highly nutritious food.

The worker bees collect the nectar from the flowers. They nourish the young ones and repair the bee hive and also protect it.

India is the world's second largest silk producing country. Kancheepuram, Thirubhuvanam and Arani are famous places for silk production in Tamil Nadu.

Study of breeding of animals and their maintenance is called Animal Husbandry.

Choose the best answers:

1. _____ is the daily essential product which is obtained from cattle.

(a) Egg

(b) Milk

(c) Both of them

(d) None of them

2. Eggs are rich in _____

(a) Protein

(b) Carbo hydrate

(c) Fat

(d) Acid

3. Which parts of the goat and sheep is used for manufacturing clothes.

(a) Leg

(b) Hand

(c) Hair

(d) Head

4. The cultivation and production of silk is known as _____

(a) Horticulture

(b) Floriculture

(c) Agriculture

(d) Sericulture

5. Sorter's Disease is otherwise known as _____

(a) Asthma

(b) Anthrax

(c) Typhoid

(d) Cholera

Fill in the blanks:

1. Proteins and _____ is rich in milk.

2. _____ is extracted from bee hives.

3. Anthrax is caused by _____

4. _____ is the strongest natural fibre.

5. Peace silk was produced in the year _____

State true or false. If false, correct the statement:

1. Animals are the greatest gift of nature.

2. Horse hair is used as bristles in small painting brushes.

3. Wool is the fibre derived from the silk worm.

4. Ahimsa silk is otherwise known as Mulberry silk.

5. Penicillin is the best medicine for curing Anthrax.

Match the following:

1. Cocoons - meat
2. Peace silk - poultry
3. Broilers - silk worm
4. Sweet liquid - Andhra Pradesh
5. Goat - honey

Complete the analogy:

1. Water: pipe: Electric current :: _____
2. Copper: conductor: wood :: _____
3. Length: metre scale: current :: _____
4. Milli ampere: micro ampere: 10^{-3} A :: _____

Consider the statements given below and choose the correct option:

1. Assertion: Wool is the fibre derived from the fur of animals.

Reason: Animals like goat, Yak, Alpaca and rabbit yields wool.

- (a) Both Assertion and reasoning is correct
- (b) Assertion is correct but reason is wrong
- (c) Assertion is wrong but reason is correct
- (d) Assertion and Reason are incorrect

2. Assertion: Penicillin or ciprofloxacin are the best medicine.

Reason: These medicines cures cow pox

- (a) Assertion is correct but reason is wrong
- (b) Assertion is wrong but reason is correct
- (c) Assertion is wrong reason is also wrong
- (d) Assertion is correct and reason is correct

Answers:**Choose the best answers:**

1. Milk 2. Protein 3. Hair 4. Sericulture 5. Anthrax

Fill in the blanks:

1. Vitamins 2. Honey 3. Bacillus anthracis 4. Silk 5. 1992

State True or False:

1. True
2. True
3. False

Correct Statement: Wool is the fibre derived from the fur of the animals.

4. False

Correct Statement: Ahimsa silk is otherwise known as Peace silk.

5. True

Match the following:

1. Silk worm 2. Andhra Pradesh 3. Poultry 4. Honey 5. Meat

Complete the analogy:

1. Wire 2. Non-conductor 3. Ammeter 4. 10^{-6} A

Consider the statements given below and choose the correct option:

1. Both Assertion and reasoning is correct

2. Assertion is correct but reason is wrong

7th Science Lesson 19

19] Visual Communication

Choose the best answers:

1. The Keyboard shortcut is used to copy the selected text

(a) Ctrl + c

(b) Ctrl + v

(c) Ctrl + x

(d) Ctrl + A

2. The Keyboard is used to cut the selected text

(a) Ctrl + c

(b) Ctrl + v

(c) Ctrl + x

(d) Ctrl + A

3. How many types of page orientation are there in Libre office Writer?

(a) 1

(b) 2

(c) 3

(d) 4

4. If the ruler is not displayed in the screen, _____ option is clicked.

(a) View → ruler

(b) View → task

(c) File → save

(d) Edit → paste

5. The menu is used to save the document

(a) File → open

(b) File → print

(c) File → save

(d) File → close

Answers:

Choose the best answer:

1. Ctrl + c 2. Ctrl + x 3. 2 4. View → ruler 5. File → save

8th Science Lesson 1

1] Measurement

Do You Know?

The 'CGS', 'MKS' and SI units are metric systems of units and 'FPS' is not a metric system. It is a British system of units.

In December, 1998, the National Aeronautics and Space Administration (NASA), USA, launched the Mars Climate Orbiter to collect data about the Martian climate. Nine months later, on September 23, 1999, the Orbiter disappeared while approaching Mars at an unexpected low altitude. An investigation revealed that the orbital calculations were incorrect due to an error in the transfer of information between the spacecraft's team in Colorado and the mission navigation team in California. One team was using the English FPS system of units for calculation, while the other team was using the MKS system of units. This misunderstanding caused a loss of 125 million dollars approximately.

Problem 1:

If 2 coulomb of charge flows through a circuit for 10 seconds, calculate the current.

Solution: Charge (Q) = 2 C

Time (t) = 10 s

$I = Q/t = 2/10 = 0.2 \text{ A}$.

Luminous flux or Luminous power is the measure of the perceived power of light. Its SI unit is 'lumen'. One lumen is defined as the luminous flux of the light produced by the light source that emits one candela of luminous intensity over a solid angle of one steradian.

The number 6.023×10^{23} is also known as Avogadro number.

Problem 2: Convert 60° into radian.

Solution: We know that, $1^\circ = \pi/180$

$60^\circ = \pi/180 \times 60 = \pi/3 \text{ radian}$.

Problem 3: Convert $\pi/4$ into degrees.

Solution: We know that, $\pi \text{ radian} = 180^\circ$

$\pi/4$ radian = $180/4 = 45^\circ$.

Until 1995, plane angle and solid angle were classified under supplementary quantities. In 1995, they were shifted to derived quantities.

Greenwich Mean Time (GMT) is the mean solar time at the Royal Observatory, located at Greenwich in London. It is measured at the longitude of zero degree. The Earth is divided into 24 zones, each of a width of 15 degree longitude. These regions are called as "Time Zones". Time difference between two adjacent time zones is 1 hour.

Indian Standard Time (IST) : The location of Mirzapur in Uttar Pradesh is taken as the reference longitude of the Indian Standard Time. It is located at 82.5 degree longitude. IST = GMT + 5:30 hours.

Problem 5: Round off the number 1.868 to two decimal places.

Solution: We need to round off the number to two decimal places. So, the last digit to be kept is 6. Since the next digit is more than 5, we should increase the second digit by one. So, the answer is 1.87.

Choose the best answers:

1. Which one the following systems of unit is the British System of unit?

- (a) CGS
- (b) MKS
- (c) FPS
- (d) SI

2. Electric current is a _____ quantity.

- (a) Base
- (b) Supplementary
- (c) Derived
- (d) Professional

3. SI unit of temperature is _____

- (a) Celsius
- (b) Fahrenheit
- (c) Kelvin
- (d) Ampere

4. Luminous intensity is the intensity of _____

- (a) Laser light
- (b) UV light
- (c) Visible light
- (d) IR light

5. Closeness of two or more measured values is called as _____

- (a) Accuracy
- (b) precision

(c) error

(d) approximation

6. Which one of the following statement is wrong?

(a) Approximation gives accurate value.

(b) Approximation simplifies the calculation

(c) Approximation is very useful when little information is available

(d) Approximation gives the nearest value only

Fill in the blanks:

1. The solid angle is measured in _____.

2. The coldness or hotness of a substance is expressed by _____.

3. _____ is used to measure electric current.

4. One mole of a substance contains _____ atoms or molecules.

5. The uncertainty in measurement is called as _____.

6. The closeness of the measured value to the original value is _____.

7. The intersection of two straight lines gives us _____.

State true or false. If false, correct the statement:

1. Temperature is a measure of total kinetic energy of the particles in a system.

2. If one coulomb of charge is flowing in one minute, it is called 'ampere'.

3. Amount of substance gives the number of particles present in a substance.

4. Intensity of light coming from a candle is approximately equal to one 'candela'.

5. Quartz clocks are used in GPS devices.

6. Angle formed at the top of a cone is an example for 'plane angle'.

7. The number 4.582 can be rounded off as 4.58.

Match the following:

1. Temperature - Closeness to the actual value

2. Plane angle - Measure of hotness or coldness

3. Solid angle - Closeness to two or more measurements

4. Accuracy - Angle formed by the intersection of three or more planes

5. Precision - Angle formed by the intersection of two planes

Consider the statements given below and choose the correct option:

1. Assertion: The SI system of units is the suitable system for measurements.

Reason: The SI unit of temperature is Kelvin.

(a) Both assertion and reason are true and reason is the correct explanation of the assertion.

(b) Both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) Assertion is true, but reason is false.

(d) Both assertion and reason are false.

2. Assertion: Electric current, amount of substance, luminous intensity are the fundamental physical quantities.

Reason: They are independent of each other.

(a) Both assertion and reason are true and reason is the correct explanation of the assertion.

(b) Both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) Assertion is true, but reason is false.

(d) Both assertion and reason are false.

3. Assertion: Radian is the unit of solid angle.

Reason: One radian is the angle subtended at the centre of a circle by an arc of length equal to its radius.

(a) Both assertion and reason are true and reason is the correct explanation of the assertion.

(b) Both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) Assertion is true, but reason is false.

(d) Both assertion and reason are false.

Answers:

Choose the best answers:

1. FPS, 2. Base, 3. Kelvin, 4. Visible light, 5. Precision 6. Approximation gives accurate value

Fill in the blanks:

1. Steradian 2. Scientists 3. Ammeter 4. 6.023×10^{23}

5. Error 6. Accuracy 7. Plane angle

State true or false. If false, correct the statement:

1. False

Correct statement: Temperature is a measure of average kinetic energy of the particles in a system

2. False

Correct statement: If one coulomb of charge is flowing in one second, it is called 'ampere'.

3. True

4. True

5. False

Correct statement: atomic clocks are used in Global Positioning System (GPS)

6. True

7. True

Match the following:

1. Temperature - Measure of hotness or coldness
2. Plane angle - Angle formed by the intersection of two planes
3. Solid angle - Angle formed by the intersection of three or more planes
4. Accuracy - Closeness to the actual value
5. Precision - Closeness to two or more measurements

Consider the statements given below and choose the correct option:

1. Both assertion and reason are true but reason is not the correct explanation of the assertion
2. Both assertion and reason are true and reason is the correct explanation of the assertion
3. Assertion is true, but reason is false

(Steradian is the unit of solid angle)

8th Science Lesson 2

2] Force And Pressure

Do You Know?

Problem 1: The average weight of an elephant is 4000 N. The surface area of the sole of its foot is 0.1 m^2 . Calculate the pressure exerted by one foot of an elephant.

Solution: Average weight of the elephant = 4000 N

Weight of one leg = Force exerted by one leg = $4000 / 4 = 1000 \text{ N}$

Area of the sole of one foot = 0.1 m^2

Pressure = Force/Area = $1000/0.1 = 10000$

$\text{N/m}^2 = 10^4 \text{ Nm}^{-2}$.

It is very difficult for us to walk on sand. But, camels can walk easily on it because they have large padded feet, which increase the area of contact with the sandy ground. This reduces the pressure and enables them to walk easily on the sand.

Cooking in a place located at a higher altitude is difficult. Why? At a higher altitude, due to lack of atmospheric pressure the boiling point of a substance reduces. So, water boils even at 80°C . The thermal energy that is produced at this temperature is not sufficient enough for baking or cooking. So, cooking is difficult at higher altitude.

Why dams are made stronger and broader at the bottom than at the top? Why do scuba divers wear a special suit while they go into deep sea levels?

Choose the correct answer:

1. If we apply force against the direction of motion of the body, then the body will
 - (a) Stop moving
 - (b) move with an increased speed
 - (c) Move with a decreased speed
 - (d) move in a different direction
2. Pressure exerted by a liquid is increased by

- (a) The density of the liquid
- (b) The height of the liquid column
- (c) Both a and b
- (d) None of the above
3. Unit of pressure is
- (a) Pascal
- (b) Nm^{-2}
- (c) Poise
- (d) Both a and b
4. The value of the atmospheric pressure at sea level is
- (a) 76 cm of mercury column
- (b) 760 cm of mercury column
- (c) 176 cm of mercury column
- (d) 7.6 cm of mercury column
5. Pascal's law is used in
- (a) Hydraulic lift
- (b) Brake system
- (c) Pressing heavy bundles
- (d) All the above
6. Which of the following liquids has more viscosity?
- (a) Grease
- (b) Water
- (c) Coconut oil
- (d) Ghee
7. The unit of viscosity is
- (a) Nm^2
- (b) Poise
- (c) kgms^{-1}
- (d) No unit

Fill in the blanks:

1. The pressure of a liquid column _____ with the depth of the column.
2. Hydraulic lift works under the principle of _____.
3. The property of _____ of a liquid surface enables the water droplets to move upward in plants.

4. A simple barometer was first constructed by _____.

State true or false. If false, correct the statement:

1. Force acting on a given area is called pressure.
2. A moving body comes to rest due to friction alone.
3. A body will sink if the weight of the body is greater than the buoyant force.
4. One atmosphere is equivalent to 1,00,000 Newton force acting on one square metre.
5. Rolling friction is slightly greater than the sliding friction.
6. Friction is the only reason for the loss of energy.
7. Liquid pressure decreases with the decrease of depth.
8. Viscosity depends on the pressure of a liquid.

Match the following:

(a)

1. Static friction - Viscosity
2. Kinetic friction - Least friction
3. Rolling friction - Objects are in motion
4. Friction between the liquid layers - Objects are sliding
5. Sliding friction - Objects are at rest

(b)

1. Barometer - reduce friction
2. Increasing area of contact - Atmospheric pressure
3. Decreasing area of contact - cause of friction
4. Lubricants - increases friction
5. Irregular surface - decreases friction

Complete the analogy:

1. Knot in a thread: _____ friction :: Ball bearing: _____ friction.
2. Downward force: Weight :: Upward force offered by liquid: _____.

Numerical problem:

1. A stone weighs 500 N. calculate the pressure exerted by it, if it makes contact with a surface of area 25 cm².

Consider the statements given below and choose the correct option:

1. Assertion: Sharp knives are used to cut the vegetables.

Reason: Sharp edges exert more pressure.

- (a) Both assertion and reason are true and reason is the correct explanation of the assertion.
- (b) Both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) Assertion is true, but reason is false.

(d) Both assertion and reason are false.

2. Assertion: Broad straps are used in bags.

Reason: Broad straps last for long.

(a) Both assertion and reason are true and reason is the correct explanation of the assertion.

(b) Both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) Assertion is true, but reason is false.

(d) Both assertion and reason are false.

3. Assertion: Water strider slides easily on the surface of water.

Reason: Water strider experiences less buoyant force.

(a) Both assertion and reason are true and reason is the correct explanation of the assertion.

(b) Both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) Assertion is true, but reason is false.

(d) Both assertion and reason are false.

Answers:

Choose the correct answer:

1. Stop moving, 2. Both a & b 3. Both a & b 4. 76 cm of mercury column 5. All the above 6. Grease 7. Poise

Fill in the blanks:

1. Increases 2. Pascal's law 3. Surface tension 4. Torricelli

State true or false. If false, correct the statement:

1. True

2. True

3. True

4. True

5. False

Correct answer: Rolling friction is slightly lesser than the sliding friction

6. True

7. True

8. True

Match the following:

A.

1. Static friction - Objects are at rest

2. Kinetic friction - Objects are in motion

3. Rolling friction - Least friction

4. Friction between the liquid layers – Viscosity

5. Sliding friction - Objects are sliding

B.

1. Barometer - Atmospheric pressure

2. Increasing area of contact - increases friction

3. Decreasing area of contact - decreases friction

4. Lubricants - reduce friction

5. Irregular surface - cause of friction

Complete the analogy:

1. Rolling, Static

2. Buoyant force

Numerical problem:

1. Pressure, $P = F/A$

$$= 500/25 \times 10^{-4}$$

$$= 20 \times 10^4 \text{ Pa}$$

Consider the statements given below and choose the correct option:

1. Both assertion and reason are true and reason is the correct explanation of assertion.

2. Both assertion and reason are true, but reason is not the correct explanation of assertion.

Correct Reason: Broad straps produce large area of contact with shoulder which reduce pressure

3. Both assertion and reason are true, but reason is not the correct explanation of assertion.

Correct Reason: It is due to surface tension of water

8th Science Lesson 3

3] Light

Do You Know:

Method of coating a glass plate with a thin layer of reflecting metals was in practice during the 16th century in Venice, Italy. They used an amalgam of tin and mercury for this purpose. Nowadays, a thin layer of molten aluminium or silver is used for coating glass plates that will then become mirrors.

Convex mirrors used in vehicles as rear-view mirrors are labeled with the safety warning: 'Objects in the mirror are closer than they appear'. This is because inside the mirrors, vehicles will appear to be coming at a long distance.

The principle behind the working of a parabolic mirror has been known since the Greco-Roman times. The first mention of these structures was found in the book, 'On Burning Mirrors', written by the mathematician Diocles. They were also studied in the 10th century, by a physicist called Ibn Sahl. The first parabolic mirrors were constructed by Heinrich Hertz, a German physicist, in the form of reflector antennae in the year 1888.

Problem 1: The radius of curvature of a spherical mirror is 20 cm. Find its focal length.

Solution: Radius of curvature = 20 cm

Focal length (f) = Radius of curvature/2

$$= R/2 = 20/2 = 10 \text{ cm.}$$

Problem 2: Focal length of a spherical mirror is 7 cm. what is its radius of curvature?

Solution: Radius of curvature (R) = 2 x Focal length = 2 x 7 = 14 cm.

Silver metal is the best reflector of light. That is why a thin layer of silver is deposited on the side of materials like plane glass sheets, to make mirrors.

Problem 3: If two plane mirrors are inclined to each other at an angle of 90° , find the number of images formed.

Solution: Angle of inclination = 90° ,

Number of images formed = $(360^\circ/\theta) - 1 = (360^\circ/90^\circ) - 1 = 4 - 1 = 3$.

Problem 4: Speed of light in air is $3 \times 10^8 \text{ ms}^{-1}$ and the speed of light in a medium is $2 \times 10^8 \text{ ms}^{-1}$. Find the refractive index of the medium with respect to air.

Solution: Refractive index (μ) = Speed of light in air (c) / Speed of light in the medium (v)

$\mu = (3 \times 10^8) / (2 \times 10^8) = 1.5$.

Problem 5: Refractive index of water is $4/3$ and the refractive index of glass is $3/2$. Find the refractive index of glass with respect to the refractive index of water.

Solution: ${}_w\mu_g$ Refractive index of glass/Refractive index of water = $(3/2) / (4/3) = 9/8 = 1.125$.

The information if rainbow is an example of dispersion of white light. This can be seen on the opposite side of the Sun. after rainfall, large number of droplets still remain suspended in the air. When white light passes through them, it is split into seven colours. Dispersion of white light from a large number of droplets eventually forms a rainbow.

Choose the best answers:

1. Which of the following has curved reflecting surface?

- (a) Plane mirrors
- (b) Spherical mirrors
- (c) Simple mirrors
- (d) None of the above

2. The spherical mirror with a reflecting surface curved inward is called

- (a) Convex mirror
- (b) Concave mirror
- (c) Curved mirror
- (d) None of the above

3. The spherical mirror used as a rear view mirror in the vehicle is

- (a) Concave mirror
- (b) Convex mirror
- (c) Plane mirror
- (d) None of these

4. The imaginary line passing through the centre of curvature and pole of a spherical mirror is called

(a) Centre of curvature

(b) Pole

(c) Principle axis

(d) Radius curvature

5. The distance from the pole to the focus is called

(a) Pole length

(b) Focal length

(c) Principle axis

(d) None of the above

6. If the image and object distance is same, then the object is placed at

(a) Infinity

(b) at F

(c) between f and P

(d) at C

7. If the focal length of a spherical mirror is 10 cm, what is the value of its radius of curvature?

(a) 10 cm

(b) 5 cm

(c) 20 cm

(d) 15 cm

Fill in the blanks:

1. The spherical mirror used in a beauty parlour as make-up mirror is _____.

2. Geometric centre of the spherical mirror is _____.

3. Nature of the images formed by a convex mirror is _____.

4. The mirror used by the ophthalmologist to examine the eye is _____.

5. If the angle of incidence is 45° , then the angle of reflection is _____.

6. If an object is placed between two mirrors which are parallel to each other, the number of images formed is _____.

Match the following:

1. Convex mirror - Radio telescopes

2. Parabolic mirror - Rear – view mirror

3. Snell's law - Kaleidoscope

4. Dispersion of light - $\sin i / \sin r = \mu$

5. Multiple reflection – Rainbow

Answers:**Choose the best answers:**

1. Spherical mirrors 2. Concave mirror 3. Convex mirror 4. Principal axis 5. Focal length 6. at C 7. 20 Cm

Fill in the blanks:

1. Concave mirror 2. Pole 3. Smaller, Virtual & erect 4. Concave mirror 5. 45° 6. Infinite

Match the following:

1. mirror - Rear – view mirror
2. Convex Parabolic mirror - Radio telescopes
3. Snell's law - $\sin i / \sin r = \mu$
4. Dispersion of light - Rainbow
5. Multiple reflection – Kaleidoscope

8th Science Lesson 4**4] Heat****Do You Know?**

Electric wires used for long distance transmission of electricity will expand during day time and contract at night. That is why they will not be set very tightly. If they are set very tightly they will break when they cool at night.

Water is the only matter on the Earth that can be found naturally in all three states – Solid, Liquid and Gas.

All metals are good conductors of heat. The substances which does not conduct heat easily are called bad conductors or insulators. Wood, cork, cotton, wool, glass, rubber, etc. are insulators.

Heat transfer by radiation is visible to our eyes. When a substance is heated to 500°C the radiation begins to become visible to the eye as a dull red glow, and it is sensed as warmth by the skin. Further heating rapidly increases the amount of radiation, and its perceived colour becomes orange, yellow and finally white.

The amount of energy in food items is measured by the unit kilo calorie. 1 kilo calorie = 4200 J (Approximately).

Water has higher heat capacity than most other substances. This accounts for the use of water as common coolant. 100 g of water can take away more heat than 100 g of oil.

Problem 1: The temperature of a metal ball is 30°C . When an energy of 3000 J is supplied, its temperature raises by 40°C . Calculate its heat capacity.

Solution: Heat capacity, $C = Q/\Delta T$

Here, $Q = 3000 \text{ J}$

$\Delta T = 40^\circ\text{C} - 30^\circ\text{C} = 10^\circ\text{C}$ or 10K

$C = 3000/10 = 300 \text{ JK}^{-1}$

The heat capacity of the metal ball is 300 JK^{-1} .

Problem 2: The energy required to raise the temperature of an iron ball by 1 K is 500 JK^{-1} . Calculate the amount of energy required to raise its temperature by 20 K.

Solution: Heat capacity, $C = Q/\Delta T$

$Q = C \times \Delta T$

Here, $C = 500 \text{ J K}^{-1}$

$$\Delta T = 20 \text{ K}$$

$\therefore Q = 500 \times 20 = 10000 \text{ J}$. the amount of heat energy required is 10000 J.

Problem 3: An energy of 84000 J is required to raise the temperature of 2 kg of water from 60°C to 70°C . Calculate the specific heat capacity of water.

Solution: Specific heat capacity, $C = Q/m \times \Delta T$

Here, $Q = 84000 \text{ J}$

$m = 2 \text{ kg}$

$$\Delta T = 70^\circ\text{C} - 60^\circ\text{C} = 10^\circ\text{C} \text{ or } 10 \text{ K}$$

$$C = 84000/2 \times 10 = 4200 \text{ J kg}^{-1} \text{ K}^{-1}$$

The Specific heat capacity of water is $4200 \text{ J kg}^{-1} \text{ K}^{-1}$.

Problem 4: The specific heat capacity of a metal is $160 \text{ J kg}^{-1} \text{ K}^{-1}$. Calculate the amount of heat energy required to raise the temperature of 500 gram of the metal from 125°C to 325°C .

Solution: Specific heat capacity, $C = Q/m \times \Delta T$

$$Q = C \times m \times \Delta$$

Here, $C = 160 \text{ J kg}^{-1} \text{ K}^{-1}$

$m = 500 \text{ g}$, $g = 0.5 \text{ kg}$

$$\Delta T = 325^\circ\text{C} - 125^\circ\text{C} = 200^\circ\text{C} \text{ or } 200 \text{ K} = 160 \times 0.5 \times 200 = 16000 \text{ J. the amount of heat energy required is } 16000 \text{ J.}$$

The world's first ice-calorimeter was used in the year 1782 by Antoine Lavoisier and Pierre-Simon Laplace, to determine the heat generated by various chemical changes.

The vacuum flask was invented by Scottish scientist Sir James Dewar in 1892. In his honour it is called as Dewar flask. It's also known as Dewar bottle.

Choose the best answers:

1. Heat is a form of _____.

- (a) Electrical energy
- (b) Gravitational energy
- (c) Thermal energy
- (d) None of these

2. If you apply some heat energy to a substance, which of the following can take place in it?

- (a) Expansion
- (b) Increase in temperature
- (c) Change of state
- (d) All the above

3. Which of the following substances will absorb more heat energy?

(a) Solid

(b) Liquid

(c) Gas

(d) All the above

4. If you apply equal amount of heat to a solid, liquid and gas individually, which of the following will have more expansion?

(a) Solid

(b) Liquid

(c) Gas

(d) All the above

5. The process of converting a liquid into a solid is called _____.

(a) Sublimation

(b) Condensation

(c) Freezing

(d) Deposition

6. Conduction is the way of heat transfer which takes place in a _____.

(a) Solid

(b) Liquid

(c) Gas

(d) All the them

Fill in the blanks:

1. A calorimeter is a device used to measure the _____.

2. _____ is defined as the amount of heat required to raise the temperature of 1 kg of a substance by 1°C.

3. A thermostat is a device which maintains _____.

4. The process of converting a substance from gaseous state to solid state is called _____.

5. If you apply heat energy, the temperature of a system will _____.

6. If the temperature of a liquid in a container is decreased, then the inter-atomic distance will _____.

State true or false. If false, correct the statement:

1. The applied heat energy can be realised as an increase in the average kinetic energy of the molecules.

2. The dimensions of a substance are increased if the temperature of the substance is decreased.

3. The process of converting a substance from solid state to gaseous state is called condensation.

4. Convection is the process by which the thermal energy flows in solids.

5. The amount of heat gained by a substance is equal to the product of its mass and latent heat.

6. In a thermos flask, the silvered walls reflect and radiate the heat outside.

Match the following:

1. Conduction - Liquid
2. Convection - Gas to liquid
3. Radiation - Solid to gas
4. Sublimation - Vacuum
5. Condensation - Solid

Consider the statements given below and choose the correct option:

1. Assertion: Radiation is a form of heat transfer which takes place only in vacuum.

Reason: The thermal energy is transferred from one part of a substance to another part without the actual movement of the atoms or molecules.

- (a) Both assertion and reason are true and reason is the correct explanation of the assertion.
- (b) Both assertion and reason are true but reason is not the correct explanation of the assertion.
- (c) Assertion is true, but reason is false.
- (d) Both assertion and reason are false.

2. Assertion: A system can be converted from one state to another state.

Reason: It takes place when the temperature of the system is constant.

- (a) Both assertion and reason are true and reason is the correct explanation of the assertion.
- (b) Both assertion and reason are true but reason is not the correct explanation of the assertion.
- (c) Assertion is true, but reason is false.
- (d) Both assertion and reason are false.

Answers:

Choose the best answers:

1. Thermal energy 2. All the above 3. All the above 4. Gas 5. Freezing 6. Solid

Fill in the blanks:

1. Heat capacity of water 2. Specific heat capacity 3. Temperature of an object constant
4. Deposition 5. Increase 6. Decrease

State true or false. If false, correct the statement:

1. True
2. False

Correct answer: The dimensions of a substance are increased if the temperature of the substance is increased

3. False

Correct answer: The process of converting a substance from solid state to gaseous state is called sublimation

4. False

Correct answer: Convection is the process by which the thermal energy flows in liquids and gases

5. True
6. False

Correct answer: In a thermos flask, the silvered walls reflect and radiate the heat back into the flask itself

Match the following:

1. Conduction- Solid
2. Convection- Liquid
3. Radiation- Vacuum
4. Sublimation- Solid to gas
5. Condensation- Gas to liquid

Consider the statements given below and choose the correct option:

1. Both assertion and reason are true, but reason is not the correct explanation of assertion.
2. Both assertion and reason are true and reason is the correct explanation of assertion

8th Science Lesson 5

5] Electricity

Do You Know?

A neutral object can become positively charged when electrons get transferred to another object; not by receiving extra positive charges.

If a positively charged glass rod is brought near another glass rod, the rods will move apart as they repel each other. If a positively charged glass rod is brought close to a negatively charged ebonite rod, the rods will move toward each other as they attract. The force of attraction or repulsion is greater when the charged objects are closer.

The materials which allow electric charges to pass through them easily are called conductors of electricity. For example, metals like aluminium, copper are good conductors of electricity. Materials which do not allow electric charges to pass through them easily are called insulators. Rubber, wood and plastic are insulators.

The first electroscope developed in 1600 by William Gilbert was called versorium. The versorium was simply a metal needle allowed to pivot freely on a pedestal. The metal would be attracted to charged bodies brought near.

Lightning's extreme heat will vaporize the water inside a tree, creating steam that may burn out the tree.

During lightning and thunder, we should avoid standing in ground or open spaces. You should make yourself as small as possible by squatting. It is however safe to stay inside a car because the car acts as a shield and protects us from the electric field generated by the storm.

The electric eel is a species of fish which can give electric shocks of up to six hundred fifty volts of electricity. But if the eel repeatedly shocks, its electric organs become completely discharged. Then a person can touch it without being shocked.

Choose the best answers:

1. When an ebonite rod is rubbed with fur, the charge acquired by the fur is
 - (a) Negative
 - (b) Positive
 - (c) Partially positive and partly negative
 - (d) None of these
2. The electrification of two different bodies on rubbing is because of the transfer of

(a) Neutrons

(b) protons

(c) electrons

(d) Protons and neutrons

3. Which of the following a simple circuit must have?

(a) Energy source, Battery, Load

(b) Energy source, Wire, Load

(c) Energy source, Wire, Switch

(d) Battery, Wire, Switch

4. An electroscope has been charged by induction with the help of charged glass rod. The charged glass rod. The charge on the electroscope is

(a) Negative

(b) Positive

(c) Both positive and negative

(d) None of the above

5. Fuse is

(a) A switch

(b) A wire with low resistance

(c) A wire with high resistance

(d) A protective device for breaking an electric circuit

Fill in the blanks:

1. _____ takes place by rubbing objects together.

2. The body which has lost electrons becomes _____.

3. _____ is a device that protects building from lightning strike.

4. _____ has a thin metallic filament that melts and breaks the connection when the circuit is overheated.

5. Three bulbs are connected end to end from the battery. This connection is called _____.

State true or false. If false, correct the statement:

1. The charge acquired by an ebonite rod rubbed with a piece of flannel is negative.

2. A charged body induces an opposite charge on an uncharged body when they are brought near.

3. Electroscope is a device used to charge a body by induction.

4. Water can conduct electricity.

5. In parallel circuit, current remains the same in all components.

Match the following:

1. Two similar charges - acquires a positive charge
2. Two dissimilar charges - prevents a circuit from overheating
3. When glass rod is rubbed with silk - repel each other
4. When ebonite rod is rubbed with fur - attract each other
5. Fuse - acquires a negative charge

Consider the statements given below and choose the correct option:

1. Assertion: People struck by lightning receive a severe.

Reason: Lightning carries very high voltage.

- (a) Both assertion and reason are true and reason is the correct explanation of the assertion.
- (b) Both assertion and reason are true but reason is not the correct explanation of the assertion.
- (c) Assertion is true, but reason is false.
- (d) Both assertion and reason are false.

2. Assertion: It is safer to stand under a tall tree during lightning.

Reason: It will make you the target for lightning.

- (a) Both assertion and reason are true and reason is the correct explanation of the assertion.
- (b) Both assertion and reason are true but reason is not the correct explanation of the assertion.
- (c) Assertion is true, but reason is false.
- (d) Both assertion and reason are false.

Answers:**Choose the best answers:**

1. Positive 2. Electrons 3. Battery, Wire, Switch 4. Positive 5. a protective device for breaking an electric circuit

Fill in the blanks:

1. Transfer of electrons 2. Positive 3. Lightning arrestor 4. Electric fuse 5. Series circuit

State true or false. If false, correct the statement:

1. True
2. True
3. True
4. True
5. False

Correct answer: In parallel circuit, current remains the same in all components.

Match the following:

1. Two similar charges- repel each other
2. Two dissimilar charges- attract each other
3. When glass rod is rubbed with silk- acquires a positive charge
4. When ebonite rod is rubbed with fur- acquires a negative charge
5. Fuse- prevents a circuit from overheating

Consider the statements given below and choose the correct option:

1. Both assertion and reason are true and reason is the correct explanation of assertion
2. Assertion is false but reason is true

8th Science Lesson 6

6] Sound

Do You Know?

Thomas Alva Edison, in 1877 invented the phonograph, a device that played the recorded sound.

Wavelength is the distance between two consecutive particles, which are in the same phase of vibration. It is denoted by the Greek letter ' λ '. The unit of wavelength is metre (m). Frequency is the number of vibrations of a particle in the medium, in one second. It is denoted by ' n '. The unit of frequency is hertz (Hz).

Problem 1: A sound has a frequency of 50 Hz and a wavelength of 10 m. What is the speed of the sound?

Solution: Given, $n = 50$ Hz, $\lambda = 10$ m

$$v = n \lambda$$

$$v = 50 \times 10 = 500 \text{ ms}^{-1}$$

Problem 2: A sound has a frequency of 5 Hz and a speed of 25 ms^{-1} . What is the wavelength of the sound?

Solution: Given, $n = 5$ Hz, $v = 25 \text{ ms}^{-1}$

$$v = n \lambda$$

$$\lambda = v/n = 25/5 = 5 \text{ m.}$$

The amount of water vapour present in the air is known as humidity. It is less during winter and more during summer. The speed of sound increases with increase in humidity. This is because the density of air decreases with increase in humidity.

How do astronauts communicate with each other? The astronauts have devices in their helmets which transfer the sound waves from their voices into radio waves and transmit it to the ground (or other astronauts in space). This is exactly the same as how radio at your home works.

Amplitude is the maximum displacement of a vibrating particle from its mean position. It is denoted by ' A '. The unit of amplitude is 'metre' (m).

The seismic wave formed during earthquake is an example for a longitudinal wave. Wave travelling through the layers of the Earth due to explosions, earthquakes and volcanic explosions are called seismic waves. Using a hydrophone and seismometer one can study these waves and record them. Seismology is the branch of science that deals with the study of seismic waves.

A bat can hear the sounds of frequencies higher than 20,000 Hz. Bats produce ultrasonic sound during screaming. These ultrasonic waves help them to locate their way and the prey.

Choose the best answers:

1. Sound waves travel very fast in

- (a) Air
- (b) Metals
- (c) Vacuum
- (d) Liquids

2. Which of the following are the characteristics of vibrations?

i. Frequency ii. Time period iii. Pitch iv. Loudness

- (a) i and ii
- (b) ii and iii
- (c) iii and iv
- (d) i and iv

3. The amplitude of the sound wave decides its

- (a) Speed
- (b) Pitch
- (c) Loudness
- (d) Frequency

4. What kind of musical instrument is a sitar?

- (a) String instrument
- (b) Percussion instrument
- (c) Wind instrument
- (d) None of these

5. Find the odd one out.

- (a) Harmonium
- (b) Flute
- (c) Nadaswaram
- (d) Violin

6. Noise is produced by

- (a) Vibrations with high frequency
- (b) regular vibrations
- (c) Regular and periodic vibrations
- (d) irregular and non-periodic vibrations

7. The range of audible frequency for the human ear is

- (a) 2 Hz to 2000 Hz
- (b) 20 Hz to 2000 Hz
- (c) 20 Hz to 20000 Hz
- (d) 200 Hz to 20000 Hz

8. If the amplitude and frequency of a sound wave are increased, which of the following is true?

- (a) Loudness increases and pitch is higher

(b) Loudness increases and pitch is unchanged

(c) Loudness increases and pitch is lower

(d) Loudness decreases and pitch is lower

9. Which of the following may be caused by noise?

(a) Irritation

(b) Stress

(c) Nervousness

(d) All the above

Fill in the blanks:

1. Sound is produced by _____.

2. The vibrations of a simple pendulum are also known as _____.

3. Sound travels in the form of _____.

4. High frequency sounds that cannot be heard by you are called _____.

5. Pitch of a sound depends on the _____ vibration.

6. If the thickness of a vibrating string is increased, its pitch _____.

Match the following:

1. Ultrasonics - frequency below 20 Hz

2. Speed of sound in air - needs material medium

3. Infrasonics - 330 ms^{-1}

4. Sound propagation - frequency more than 20000 Hz

Consider the statements given below and choose the correct option:

1. Assertion: When lightning strikes, the sound is heard a little after the flash is seen.

Reason: The velocity of light is greater than that of the sound.

(a) Both assertion and reason are true and reason is the correct explanation of the assertion.

(b) Both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) Assertion is true, but reason is false.

(d) Assertion is false but reason is true.

(e) Both assertion and reason are false.

2. Assertion: Two persons on the surface of moon cannot talk to each other.

Reason: There is no atmosphere on moon.

(a) Both assertion and reason are true and reason is the correct explanation of the assertion.

(b) Both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) Assertion is true, but reason is false.

(d) Assertion is false but reason is true.

(e) Both assertion and reason are false.

Answers:**Choose the best answers:**

1. Metals 2. Pitch and Loudness 3. Loudness 4. String instrument 5. Violin

6. irregular and non-periodic vibrations 7. 20 Hz to 20000 Hz 8. Loudness increases and pitch is higher.

9. all the above

Fill in the blanks:

1. Vibrating bodies 2. Oscillation 3. Mechanical waves 4. Ultrasonic waves 5. Frequency 6. Decreases

Match the following:

1. Ultrasonics- Frequency more than 20000 Hz

2. Speed of sound in air - 330ms^{-1}

3. Infrasonics- Frequency below 20Hz

4. Sound propagation- Needs material medium

Consider the statements given below and choose the correct option:

1. Both assertion and reason are true and reason is the correct explanation of assertion.

2. Both assertion and reason are true and reason is the correct explanation of assertion.

8th Science Lesson 7**7] Magnetism****Do You Know?**

There are three types of iron ores. They are: Hematite (69% of Iron), Magnetite (72.4% of Iron) and Siderite (48.2% of Iron). Magnetite is an oxide ore of iron with the formula Fe_3O_4 . Among these ores, magnetite has more magnetic property.

William Gilbert laid the foundation for magnetism and suggested that the Earth has a giant bar magnet. William Gilbert was born on 24th May 1544. He was the first man who performed the systematic research on the properties of the lodestone (magnetic iron ore) and published his findings in the influential 'De Magnete' (The Magnet).

A compass needle, also known as plotting compass or magnetic needle, consists of a tiny pivoted magnet in the form of a pointer, which can rotate freely in the horizontal plane. The ends of the compass needle point approximately towards the geographic north and south direction.

The temperature, at which the ferromagnetic material becomes paramagnetic is called curie temperature.

Magnetisation is a process in which a substance is made a permanent or temporary magnet by exposing it to an external magnetic field. This is one of the methods to produce artificial magnets.

Alnico cow magnet is used to attract sharp iron wire and other iron objects that may be ingested by animals while grazing thereby causing damage to their digestive tract.

The most powerful magnet in the universe is actually a neutron star called magnetar (magnetic neutron star) located in the Milky Way Galaxy. The diameter of the magnetar is 20 kilometre and its mass is 2 to 3 times that of the Sun. Its magnetic field is so enormous and lethal that it is capable of absorbing all the iron atoms from the bloodstream (haemoglobin) of a living body even if it is positioned at a distance of 1000 km from it.

Earth's magnet is 20 times more powerful than a fridge magnet.

Pigeons have extraordinary navigational abilities. It enables them to find their way back home even if you take them to a place where they have never been before. The presence of magnetite in their beaks enables them to sense the magnetic field of the Earth. Such a magnetic sense is called magnetoreception.

Maglev train (Magnetic levitation train) has no wheels. It floats above its tracks due to strong magnetic forces applied by computer controlled electromagnets. It is the fastest train in the world. The speed attained by this train is around 500 km/hr.

The strip on the back of a credit card/debit card is a magnetic strip, often called a magstripe. The magstripe is made up of tiny iron-based magnetic particles in a thin plastic film. Each particle is really a very tiny bar magnet about 20 millionth of an inch long.

Choose the best answers:

1. A magnet attracts _____.

- (a) Wooden materials
- (b) Any metal
- (c) Copper
- (d) Iron and steel

2. One of the following is an example for a permanent magnet.

- (a) Electromagnet
- (b) Mumetal
- (c) Soft iron
- (d) Neodymium

3. The south pole of a bar magnet and the north pole of a U-shaped magnet will _____.

- (a) Attract each other
- (b) Repel each other
- (c) Neither attract nor repel each other
- (d) None of the above

4. The shape of the Earth's magnetic field resembles that of an imaginary _____.

- (a) U-shaped magnet
- (b) Straight conductor carrying current
- (c) Solenoid coil
- (d) Bar magnet

5. MRI stands for _____.

- (a) Magnetic Resonance Imaging
- (b) Magnetic Running Image
- (c) Magnetic Radio Imaging
- (d) Magnetic Radar Imaging

6. A compass is used for _____.

- (a) Plotting magnetic lines
- (b) Detection of magnetic field
- (c) Navigation
- (d) All of these

Fill in the blanks:

1. The magnetic strength is _____ at the poles.
2. A magnet has _____ magnetic poles.
3. Magnets are used in _____ for generating electricity.
4. _____ are used to lift heavy iron pieces.
5. A freely suspended bar magnet is always pointing along the _____ north-south direction.

Match the following:

1. Magnetite - Magnetic lines
2. A tiny pivoted magnet - Natural magnet
3. Cobalt - Compass box
4. Closed curves - Ferromagnetic material
5. Bismuth - Diamagnetic material

Consider the statements given below and choose the correct option

1. Assertion: Iron fillings are concentrated more at the magnetic poles.

Reason: The magnets are so sharp.

- (a) Both assertion and reason are true and reason is the correct explanation of the assertion.
- (b) Both assertion and reason are true but reason is not the correct explanation of the assertion.
- (c) Assertion is true, but reason is false.
- (d) Both assertion and reason are false.

2. Assertion: The Earth's magnetic field is due to iron present in its core.

Reason: At a high temperature a magnet loses its magnetic property or magnetism.

- (a) Both assertion and reason are true and reason is the correct explanation of the assertion.
- (b) Both assertion and reason are true but reason is not the correct explanation of the assertion.
- (c) Assertion is true, but reason is false.
- (d) Both assertion and reason are false.

Answers:

Choose the best answers:

1. iron and steel 2. Neodymium 3. attract each other 4. bar magnet 5. Magnetic Resonance Imaging 6. All of these

Fill in the blanks:

1. Maximum 2. Two 3. Dynamos 4. Electromagnets 5. Geographic

Match the following:

1. Magnetite - Natural magnet
2. A tiny pivoted magnet - Compass box
3. Cobalt - Ferromagnetic material
4. Closed curves - Magnetic lines
5. Bismuth - Diamagnetic material

Consider the statements given below and choose the correct option:

1. Both assertion and reason are true, but reason is not the correct explanation of assertion.
2. Assertion is false, but reason is true

8th Science Lesson 8**8] Universe And Space Science****Do You Know?**

Rockets were invented in China, more than 800 years ago. The first rockets were a cardboard tube packed with gunpowder. They were called fire arrows. In 1232 AD, the Chinese used these 'fire arrows' to defeat the invading Mongol army. The knowledge of making rockets soon spread to the Middle East and Europe, where they were used as weapons.

Polar Satellite Launch Vehicle (PSLV) and Geosynchronous Satellite Launch Vehicle (GSLV) rockets are India's popular rockets.

Rakesh Sharma, an Indian pilot from Punjab was selected as a 'Cosmonaut' in a joint space program between India and Soviet Russia and become the first Indian to enter into the space on 2nd April, 1984.

Kalam Sat is the world's smallest satellite weighing only 64 gram. It was built by a team of high school students, led by Rifath Sharook, an 18 year old school student from 'Pallapatti' near Karur, Tamil Nadu. It was launched into the space on 22nd June 2017 by NASA.

Know your scientist: Dr. Mysamy Annadurai was born on 2nd July 1958, at Kodhavadi, a small village near Pollachi in Coimbatore district. He pursued his B.E. degree course at Government College of Technology, Coimbatore. In 1982, he pursued his higher education and acquired an M.E. degree at PSG College of Technology, Coimbatore. In the same year he joined the ISRO as a scientist. And later, he got his doctorate degree from Anna University of Technology, Coimbatore. Annadurai is a leading technologist in the field of satellite system. He has served as the Project Director of Chandrayaan-1. He has also made significant contributions to the cost effective design of Chandrayaan.

Mars is the fourth planet from the Sun. It is the second smallest planet in the solar system. Mars is called as the Red Planet because of its reddish colour. Iron Oxide present in its surface and also in its dusty atmosphere gives the reddish colour to that planet. Mars rotates about its own axis once in 24 hours 37 minutes. Mars revolves around the Sun once in 687 days. The rotational period and seasonal cycles of Mars are similar to that of the Earth. Astronomers are more curious in the exploration of Mars. So, they have sent many unwanted spacecrafts to study the planet's surface, climate, and geology.

India became the first Asian country to reach Mars and the first nation in the world to achieve this in the first attempt. Soviet Space Program, NASA, and European Space Agency are the three other agencies that reached Mars before ISRO.

Know your scientist: Dr. Kailasa Vadivoo Sivan is the chairperson of the Indian Space Research Organisation (ISRO). He was born in Sarakkalvilai, in Kanyakumari district of Tamil Nadu. Sivan graduated with a bachelor's degree in Aeronautical Engineering from Madras Institute of Technology in 1980. Then he got his master's

degree in Aerospace Engineering from Indian Institute of Science, Bangalore in 1982, and started working in ISRO. He completed his doctoral degree in Aerospace Engineering from Indian Institute of Technology, Bombay in 2006. He was appointed as Chairman of ISRO from 10th January 2018. Sivan is popularly known as the 'Rocket Man' for his significant contribution to the development of cryogenic engines for India's space programs. The ability of 'ISRO' to send 104 satellites in a single mission is a great example of his expertise.

The Moon is the only natural satellite of the Earth. It is at a mean distance of about 3,84,400 km from the Earth. Its diameter is 3,474 km. It has no atmosphere of its own. It doesn't have its own light, but it reflects the sunlight. The time period of rotation of the Moon about its own axis is equal to the time period of revolution around the Earth. That's why we are always seeing its one side alone.

The members present in the crew during the Man Landing Mission were Neil Armstrong, Buzz Aldrin and Michael Collins.

Kalpana Chawla travelled over 10.4 million miles in 252 orbits of the earth, logging more than 372 hours in space.

Choose the best answers:

1. Which of the following is a celestial body?

- (a) Sun
- (b) Moon
- (c) Stars
- (d) All the above

2. Mangalyaan was sent to _____

- (a) Moon
- (b) Mars
- (c) Venus
- (d) Mercury

3. Chandrayaan – 1 was launched on

- (a) 22nd October 2008
- (b) 8th November 2008
- (c) 22nd July 2019
- (d) 22nd October 2019

4. _____ is called as Red planet.

- (a) Mercury
- (b) Venus
- (c) Earth
- (d) Mars

5. Which of the following is the working principle of Rockets?

- (a) Newton's first law
- (b) Newton's second law

(c) Newton's third law

(d) All the above

6. Cryogenic fuels are stored at

(a) Room temperature

(b) Low temperature

(c) Very low temperature

(d) Very high temperature

7. _____ was the first manned mission of NASA to go to the moon.

(a) Apollo – 5

(b) Apollo – 8

(c) Apollo – 10

(d) Apollo – 11

Fill in the blanks:

1. The study about stars and planets are known as _____.

2. Our sun belongs to _____ Galaxy.

3. Mars revolves around the Sun once in _____ days.

4. _____ is India's first interplanetary mission.

5. _____ was the first man to walk on the surface of the Moon.

State true or false. If false, correct the statement:

1. The Sun and the celestial bodies form solar system.

2. Chandrayaan-1 was launched from Sriharikota.

3. Mars is the smallest planet in the solar system.

4. PSLV and GSLV are India's popular satellites.

5. The propellant of rocket is only in the form of solids.

Match the following:

1. Chandrayaan - Fuel

2. Mangalyaan - Moon

3. Cryogenic - First manned mission to the moon

4. Apollo – 8 - First man landing mission to the moon

5. Apollo – 11 – Mars

Answers:

Choose the best answers:

1. All the above 2. Mars 3. 22nd October 2008 4. Mars 5. Newton's third law 6. very low temperature 7. Apollo-8

Fill in the blanks:

1. Astronomy 2. Milky way 3. 687 4. Mars orbiter mission 5. Neil Armstrong

State true or false. If false, correct the statement:

1. True

2. True

3. False

Correct answer: Mercury is the smallest planet in the Solar system

4. True

5. False

Correct answer: The propellant of a rocket is may be in the form of solids or liquids

Match the following:

1. Chandrayaan- Moon

2. Mangalyaan- Mars

3. Cryogenic - Fuel

4. Apollo – 8 - First manned mission to the moon

5. Apollo – 11- First man landing mission to the moon

8th Science Lesson 9**9] Matter Around Us****Do You Know?**

Compounds	Common name
Copper sulphate	Blue Vitriol
Ferrous sulphate	Green Vitriol
Potassium nitrate	Saltpetre
Sulphuric acid	Oil of Vitriol
Calcium sulphate	Gypsum
Calcium sulphate hemi hydrate	Plaster of Paris
Potassium chloride	Muriate of potash

Choose the best answers:

1. The liquid metal used in thermometers is

(a) Copper

(b) Mercury

(c) Silver

(d) Gold

2. The pictorial symbol for water given by the alchemists was



3. Which one of the following element name is not derived from planet?

- (a) Plutonium
- (b) Neptunium
- (c) Uranium
- (d) Mercury

4. Symbol of mercury is

- (a) Ag
- (b) Hg
- (c) Au
- (d) Pb

5. A form of non-metal which has high ductility is

- (a) Nitrogen
- (b) Oxygen
- (c) Chlorine
- (d) Carbon

6. The property which allows the metals to be hammered into their sheets is _____.

- (a) Ductility
- (b) Malleability
- (c) Conductivity
- (d) Shining strength

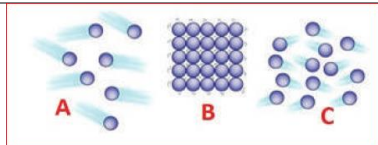
7. The non-metal which conducts electric current is

- (a) Carbon
- (b) Oxygen
- (c) Aluminium
- (d) Sulphur

8. Pencil lead contains

- (a) Graphite
- (b) Diamond
- (c) Aluminium
- (d) Sulphur

9. Identify the state of matter based on the arrangement of the molecules.



- (a) A – Gas, B – Solid, C – Liquid
 (b) A – Liquid, B – Solid, C – Gas
 (c) A – Gas, B – Solid, C – Gas
 (d) A – Liquid, B – Gas, C – Solid

Fill in the blanks:

- The element which possesses the character of both metals and non metals are called _____.
- The symbol of tungsten is _____.
- Melting point of most metal is _____ than non-metal.
- Water contains _____ and _____ element.
- _____ is used as semiconductor.

Match the following:


(a)

- Iron - for making wires
- Copper - sewing needle
- Tungsten - as a fuel for ignition in rocket
- Boron - making the filament of a bulb

(b)

- Atom - building block of matter
- Element - atoms of different kinds
- Compound - atoms of the same kind
- Molecule - smallest unit of a substance

Answers:**Choose the best answers:**

1. Mercury 2.  3. Mercury 4. Hg 5. Carbon 6. Malleability 7. Carbon
 8. Graphite 9. A - Gas, B - Solid, C – Liquid

Fill in the blanks:

- Metalloids 2. W 3. Higher 4. Hydrogen, Oxygen 5. Silicon/ Germanium

Match the following:

a)

- Iron- Sewing needle

2. Copper- For making wires
 3. Tungsten- Making the filament of a bulb
 4. Boron- As a fuel for ignition in rocket
- b)
1. Atom- Building block of matter
 2. Element- Atoms of same kinds
 3. Compound- Atoms of different kinds
 4. Molecule- Smallest unit of a substance

8th Science Lesson 10

10] Changes Around Us

Do You Know?

The head of a matchstick contains potassium chlorate and antimony trisulphide. The sides of the matchbox contain red phosphorous.

Chemical reactions accompanying evolution of heat are called exothermic reactions. Whereas chemical reactions which involve absorption of heat are called endothermic reactions.

The term electrolysis was introduced by Michael Faraday in the 19th century. The word electrolysis is a combination of two terms 'electron' and 'lysis'. Electron is related to electricity and lysis means decomposition.

Limestone is the raw material for quicklime, slaked lime and cement.

The ultraviolet rays from the sun break ozone (O₃) molecules in the stratosphere into molecular oxygen and atomic oxygen. This atomic oxygen again combines with molecular oxygen to form Ozone.

Photochemistry is the branch of chemistry which deals with chemical reactions involving light.

Enzymes and yeasts are called biocatalysts.

Choose the best answers:

1. Burning of paper is a _____ change.
 - (a) Physical
 - (b) chemical
 - (c) physical and chemical
 - (d) neutral
2. Burning of matchstick is an example for chemical reaction caused by _____.
 - (a) Contact in physical states
 - (b) electricity
 - (c) light
 - (d) catalyst
3. _____ undergoes rusting.
 - (a) Tin
 - (b) Sodium
 - (c) Copper

(d) Iron

4. The pigment responsible for browning of apples is _____.

(a) Hydrate iron (II) oxide

(b) Melanin

(c) Starch

(d) Ozone

5. Brine is a concentrated solution of _____.

(a) Sodium sulphate

(b) Sodium chloride

(c) Calcium chloride

(d) Sodium bromide

6. Limestone contains _____ mainly.

(a) Calcium chloride

(b) Calcium carbonate

(c) Calcium nitrate

(d) Calcium sulphate

7. Which of the following factor induces electrolysis?

(a) Heat

(b) Light

(c) Electricity

(d) Catalysis

8. In Haber's process of producing ammonia _____ is used as a catalyst.

(a) Nitrogen

(b) hydrogen

(c) Iron

(d) Nickel

9. Dissolved gases like sulphur dioxide and nitrogen oxides in rain water causes _____

(a) Acid rain

(b) Base rain

(c) Heavy rain

(d) Neutral rain

10. _____ is/are responsible for global warming.

(a) Carbon dioxide

(b) Methane

(c) Chlorofluorocarbons

(d) Carbon dioxide, Methane, Chlorofluorocarbons

Fill in the blanks:

1. Photosynthesis is a chemical reaction that takes place in the presence of _____.
2. Iron objects undergo rusting when exposed to _____ and _____.
3. _____ is the basic material to manufacture urea.
4. Electrolysis of brine solution gives _____ gases.
5. _____ is a chemical substance which alters the speed of a chemical reaction.
6. _____ is the enzyme responsible for browning of vegetables and fruits.

State true or false. If false, correct the statement:

1. A chemical reaction is a temporary reaction.
2. Decomposition of lead nitrate is an example for a chemical reaction caused by light.
3. Formation of slaked lime from quicklime is an endothermic reaction.
4. CFC is a pollutant.
5. Light energy may come out due to chemical reactions.

Match the following:

(a)

1. Rusting - photosynthesis
2. Electrolysis - haber's process
3. Thermolysis - iron
4. Food - Brine
5. Catalysis - decomposition of limestone

(b)

1. Spoilage - decomposition
2. Ozone - biocatalyst
3. Tarnishing - oxygen
4. Yeast - chemical reaction
5. Calcium oxide – food

Answers:

Choose the best answers:

1. Chemical
2. Light
3. Iron
4. Melanin
5. sodium chloride
6. calcium carbonate
7. Electricity
8. Iron
9. Acid rain
10. CO₂

Fill in the blanks:

1.Sunlight 2. Water, Oxygen 3. Ammonia 4. Chlorine and Hydrogen 5. Catalyst 6. Poly phenol Oxidase

State true or false. If false, correct the statement:

1.False

Correct answer: A chemical reaction is a temporary reaction

2.True

3.False

Correct answer: Formation of slaked lime from quicklime is an exothermic reaction

4.True

5.True

Match the following:

a).

1.Rusting- Iron

2.Electrolysis- Brine

3.Thermolysis- Decomposition of limestone

4.Food- Photosynthesis

5.Catalysis- Haber's process

b).

1.Spoilage - Food

2.Ozone - Oxygen

3.Tarnishing - Chemical reaction

4.Yeast - Biocatalyst

5.Calcium oxide - Decomposition

8th Science Lesson 11**11] Air****Do You Know?**

If oxygen has the capacity to burn itself, striking a match stick will be enough to burn all the oxygen in our planet's atmosphere.

Oxygen is about two times more soluble in water than nitrogen. If it had the same solubility as nitrogen, then less oxygen would be present in seas, lakes and rivers that will make life much more difficult for living organisms.

Now-a-days nitrogen is used as a substitute for compressed air in tyres. Have you noticed it? Why do people prefer nitrogen instead of compressed air in tyres?

The process of conversion of solid into vapour without reaching liquid state is called sublimation.

Venus' atmosphere consists of roughly 96-97% carbon dioxide. Because of the amount of carbon dioxide present, the surface of Venus continually retains heat and as such, the surface temperature of Venus is roughly 462°C, making it the hottest planet in our solar system.

Aerated water is nothing but carbon dioxide dissolved in water under pressure. This is also called 'soda water'.

Acid rain has pH less than 5.6 whereas pH of pure rain water is around 5.6 due to dissolution of atmospheric CO₂ in it.

Choose the best answers:

1. Which of the following is true about oxygen?

- (a) Completely burning gas
- (b) Partially burning gas
- (c) Doesn't support burning
- (d) Supports burning

2. Aerated water contains

- (a) Air
- (b) Oxygen
- (c) Carbon dioxide
- (d) Nitrogen

3. Solvay process is a method to manufacture

- (a) Lime water
- (b) aerated water
- (c) distilled water
- (d) sodium carbonate

4. Carbon dioxide with water changes

- (a) Blue litmus to red
- (b) red litmus to blue
- (c) Blue litmus to yellow
- (d) doesn't react with litmus

5. Which of the following is known as azote?

- (a) Oxygen
- (b) nitrogen
- (c) Sulphur
- (d) Carbon dioxide

Fill in the blanks:

1. _____ is called as vital life.
2. Nitrogen is _____ than air.
3. _____ is used as a fertilizer.
4. Dry ice is used as a _____.
5. The process of conversion of iron into hydrated form of oxides is called _____.

Match the following:

1. Nitrogen - respiration in living animals

2. Oxygen - fertilizer

3. Carbon dioxide - refrigerator

4. Dry ice - fire extinguisher

Answers:

Choose the best answers:

1. Supports burning 2. Carbon dioxide 3. Sodium Carbonate 4. blue litmus to red 5. Nitrogen

Fill in the blanks:

1. Oxygen 2. Lighter 3. Nitrogen 4. Refrigerant 5. Rusting

Match the following:

1. Nitrogen- Fertilizer

2. Oxygen- Respiration in living animals

3. Carbon dioxide- Fire extinguisher

4. Dry ice- Refrigerator

8th Science Lesson 12

12] Atomic Structure

Do You Know?

John Dalton, son of a poor weaver, began his career as a village school teacher at the age of 12. He became the principal of the school seven years later. In 1793, he moved to Manchester to teach Physics, Chemistry and Mathematics in a college. He proposed his atomic theory in 1803. He carefully recorded each day, the temperature, pressure and amount of rainfall from his youth till the end. He was a meticulous meteorologist.

The fact that air is a poor conductor of electricity is a blessing in disguise for us. Imagine what would happen if air had been a good conductor of electricity. All of us would have got electrocuted, when a minor spark was produced by accident.

Electricity, when passes through air, removes the electrons from the gaseous atoms and produces cations. This is called electrical discharge.

In television tube cathode rays are deflected by magnetic fields. A beam of cathode rays is directed toward a coated screen on the front of the tube, where by varying the magnetic field generated by electromagnetic coils, the beam traces a luminescent image.

When hydrogen gas was taken in a discharge tube, the positively charged particles obtained from the hydrogen gas were called protons. Each of these protons are produced when one electron is removed from one hydrogen atom. Thus, a proton can be defined as an hydrogen ion (H^+). $H \rightarrow H^+ + e^-$

When invisible radiation falls on materials like zinc sulphide, they emit a visible light (or glow). These materials are called fluorescent materials.

Choose the best answers:

1. The same proportion of carbon and oxygen in the carbon dioxide obtained from different sources proves the law of _____.

(a) Reciprocal proportion

(b) Definite proportion

(c) Multiple proportion

(d) Conservation proportion

2. Cathode rays are made up of

(a) Neutral particles

(b) Positively charged particles

(c) Negatively charged particles

(d) None of the above

3. In water, hydrogen and oxygen are combined in the ratio of _____ by mass.

(a) 1:8

(b) 8:1

(c) 2:3

(d) 1:3

4. Which of the following statements made by Dalton has not undergone any change?

(a) Atoms cannot be broken

(b) Atoms combine in small, whole numbers to form compounds

(c) Elements are made up of atoms

(d) All atoms of an elements are alike

5. In all atoms of an element

(a) The atomic and the mass number are same

(b) The mass number is same and the atomic number is different

(c) The atomic number is same and the mass number is different

(d) Both atomic and mass numbers may vary

Fill in the blanks:

1. _____ is the smallest particle of an element.

2. An element is composed of _____ atoms.

3. An atom is made up of _____, _____ and _____.

4. A negatively charged ion is called _____, while positively charged ions is called _____.

5. _____ is a negatively charged particle (Electron/Proton).

6. Proton is deflected towards the _____ charged plate (positively, negatively).

Match the following:

1. Law of conservation of mass - Sir William Crookes

2. Law of constant proportion - James Chadwick

3. Cathode rays - Joseph Proust

4. Anode rays - Lavoisier

5. Neutrons – Goldstein

Answers:

Choose the best answers:

1. definite proportion 2. negatively charged particles 3. 1:8 4. All atoms of an elements are alike

5. the atomic and the mass number are same

Fill in the blanks:

1. Atom 2. Same kind of 3. Proton, electron, Neutron 4. Anion, Cation 5. Electron 6. Negatively

Match the following:

1. Law of conservation of mass- Lavoisier
2. Law of constant proportion- Joseph Proust
3. Cathode rays- Sir William Crookes
4. Anode rays- Goldstein
5. Neutrons- James Chadwick

8th Science Lesson 13

13] Water

Do You Know?

Henry Cavendish was a British philosopher, scientist, chemist, and physicist. Cavendish is noted for his discovery of hydrogen. He called it inflammable air. He mixed metals with strong acids and created hydrogen. He created carbon dioxide also by combining metals with strong bases.

When the skaters move on ice, they exert pressure on it. This pressure lowers the freezing point. As a result, the ice melts underneath the skate and allows the skaters to glide across the ice with little effort. When the skaters move forward, pressure is decreased and the water re-freezes to ice again.

Pure water has the following physical properties. Pure water boils at 100°C at one atmospheric pressure. Pure water freezes at exactly 0°C at one atmospheric pressure. Pure water has a density of 1 gm/cm³.

The freshness of fish and meat can be maintained by placing them in contact with ice. With its larger latent heat, ice is able to absorb a large quantity of heat from the fish as it melts. Thus, food can be kept at a low temperature for an extended period of time.

Copper does not react with water at any temperature. That is why it is used for making pipes and bodies.

Tap water, river water and well water contain dissolved solids but rainwater and distilled water do not contain dissolved solids. Hence concentric rings are not formed in the rain water and distilled water after evaporation.

The salinity of water is more in the Dead Sea. It is actually a salt lake as it has a single source of water and is not connected to the ocean. It is landlocked and this causes the water to evaporate. This has led to a steady increase in its degree of salinity. Now the salinity is so high such that the marine life cannot survive in it. This is why it is called the Dead Sea.

Every year 4.6 million children die due to diarrhea. Access to clean water improves hygiene and health.

RO purifiers are the purifiers that can remove the dissolved impurities and germs. They also improved the taste of water. RO stands for the name of the technology, 'reverse osmosis', used in these purifiers. Some RO purifiers also have a UV (ultraviolet) unit that destroys the germs present in water.

Distilled water and boiled water have no taste. The pleasant taste of drinking water is due to the presence of dissolved substances which include air, carbon dioxide and minerals.

About 90% of the available surface water has already been tapped mainly for agriculture and irrigation.

The largest source of water pollution in India is untreated sewage. On an average, a person uses 135 litres of water per day for washing clothes, cooking, bathing, etc.

Plastic sheets are used in agriculture to grow vegetables. At the end of the season, these plastic sheets are ploughed back into the soil. The plastic sheets break into tiny pieces and get eaten by earth worms, which is harmful to their health and that of soil.

Micro-plastics can be found in almost every freshwater source. They have been found from the freezing waters of the Arctic and Antarctic to the bottom of the deep-sea floor upto 5,000 metres deep. Micro-plastics have been found in bottled water and tap water around the world.

Choose the best answers:

1. Water changes to ice at

- (a) 0°C
- (b) 100°C
- (c) 102°C
- (d) 98°C

2. Solubility of carbon dioxide in water is high when the

- (a) Pressure is low
- (b) Pressure is high
- (c) Temperature is high
- (d) None of the above

3. The gas collected at the cathode on electrolysis of water is

- (a) Oxygen
- (b) Hydrogen
- (c) Nitrogen
- (d) Carbon dioxide

4. Which of the following is a water pollutant?

- (a) Lead
- (b) Alum
- (c) Oxygen
- (d) Chloride

5. Permanent hardness of water is due to the presence of _____.

- (a) Sulphates and chloride
- (b) Dust particles
- (c) Carbonates and bicarbonates
- (d) Other soluble particles

Fill in the blanks:

1. Water is colourless, odourless and _____.
2. The boiling point of water is _____.
3. Temporary hardness of water can be removed by _____ of water.
4. The density of water is maximum at _____.
5. Loading speeds up the process of _____.

State true or false. If false, correct the statement:

1. Sewage should be treated well before being discharged it into water bodies.
2. Sea water is suitable for irrigation as it contains dissolved salts.
3. Excessive use of chemical fertilizers depletes the soil and causes water pollution.
4. The density of water will not change at all temperature
5. Soap lathers well in hard water.

Match the following:

1. Universal solvent - Water pollutant
2. Hard water - Kills germs
3. Boiling - Ozonisation
4. Sterilization - Water
5. Sewage - Stomach ailments

Answers:**Choose the best answers:**

1. 0°C 2. pressure is high 3. Hydrogen 4. Lead 5. sulphates and chlorides

Fill in the blanks:

1. Tasteless 2. 100°C 3. Boiling 4. 4°C 5. Sedimentation

State true or false. If false, correct the statement:

1. True
2. False

Correct answer: Sea water is not suitable for irrigation as it contains dissolved salts

3. True
4. False

Correct answer: The density of water will change at all temperature

5. False

Correct answer: Soap lathers well in soft water

Match the following:

1. Universal solvent- Water
2. Hard water- Stomach ailments
3. Boiling- Ozonisation
4. Sterilization- Kills germs
5. Sewage- Water Pollutant

8th Science Lesson 14**14] Acids And Bases****Do You Know?**

Swedish chemist Svante Arrhenius proposed a theory on acids. According to him, an acid is a substance which furnishes H^+ ions or H_3O^+ ions in aqueous solution.

We feel hungry due to the corrosive action of hydrochloric acid on the inner lining of the stomach. When the level of hydrochloric acid goes higher, it causes ulcer.

Copper or brass cooking vessels are coated with tin metal (eyam). If it is not coated the organic acids present in the food materials will react with copper and make the food poisonous. The tin isolates the vessel from the action of acids and prevents food poisoning.

Pickles remain in good condition for long time because they contain vinegar (acetic acid) or benzoic acid.

Sodium carbonate (Na_2CO_3) is commercially called as washing soda. Similarly sodium bicarbonate ($NaHCO_3$) is commercially called as baking soda. Caustic soda is sodium hydroxide ($NaOH$) and caustic potash is potassium hydroxide (KOH).

Choose the best answer:

1. Acids are _____ in taste.

- (a) Sour
- (b) Sweet
- (c) Bitter
- (d) Salty

2. Aqueous solutions of _____ conduct electricity.

- (a) Acid
- (b) Base
- (c) Salt
- (d) All of the these

3. In acidic solutions blue litmus changes into _____ colour.

- (a) Blue
- (b) Green
- (c) Red
- (d) White.

4. Base is a substance that gives _____ on dissolving in water.

- (a) OH
- (b) H*
- (c) OH
- (d) H

5. Sodium hydroxide is a _____

- (a) Acid
- (b) Base
- (c) Oxide
- (d) Alkali

6. Red ant sting contains _____

- (a) Acetic acid
- (b) Sulphuric acid
- (c) Oxalic acid
- (d) Formic acid

7. Magnesium hydroxides are used for treating _____

- (a) Acidity
- (b) Head pain
- (c) Teeth decay
- (d) None of these

8. Acid mixed with base forms _____

- (a) Salt and water
- (b) Salt
- (c) Water
- (d) No reaction.

9. We brush our teeth with tooth paste because it is _____ in nature.

- (a) Basic
- (b) Acidic
- (c) Both a and b
- (d) None of these

10. In basic solution turmeric indicator paper changes from yellow to _____

- (a) Blue
- (b) Green

(c) Yellow

(d) Red

Fill in the blanks:

1. Benzoic acids are used for _____
2. The word sour refers to _____ in Latin.
3. Bases are _____ in taste.
4. Chemical formula of calcium oxide is _____
5. Wasp sting contains _____
6. Turmeric is used as a _____
7. In acidic solution the colour of the hibiscus indicator paper will change to _____

State true or false. If false, correct the statement:

1. Most of the acids are not soluble in water.
2. Acids are bitter in taste.
3. Bases are soapy to touch when they are dry.
4. Acids are corrosive in nature.
5. All bases are alkalis.
6. Hibiscus flower is an example for natural indicator.

Answers:

Choose the best answer:

1. Sour 2. Salt and Base 3. Red 4. OH^- 5. Alkali 6. formic acid 7. Acidity 8. Salt and water 9. Basic 10. Red

Fill in the blanks:

1. Preservation of foods 2. Acidus 3. Bitter 4. CaO 5. Alkaline substance 6. Indicator 7. Deep pink or deep red

State true or false. If false, correct the statement:

1. True
2. False
Correct answer: Acids are Sour in taste
3. False
Correct answer: Bases are soapy to touch only in aqueous media, not in dry nature
4. True
5. False
Correct answer: All alkali are bases, but not all base is alkali
6. True

15] Chemistry In Everyday Life

Do you know?

Propane is used in LPG cylinders. Since it is an odourless gas, any leakage cannot be detected. Hence, a chemical by name Mercaptan is mixed with LPG to help in detection of any leakage of LPG.

The average composition of CNG

Constituents	Percentage
Methane	88.5
Ethane	5.5
Propane	3.7
Butane	1.8
Pentane	0.5

Moderate temperature and humidity is needed to keep paintings and other ancient artifacts from being destroyed by environmental factors. Thus natural gas is used in museums to protect the monuments.

Producer gas is known by different names in different countries. It is referred as wood gas in USA and as Suction gas in UK.

People in ancient cultures used crude oil for binding materials. It was also used as a sealant for water proofing various surfaces.

It is also known as black diamond owing to its precious nature. On destructive distillation, 1000 kg of coal gives 700 kg of coke, 100 litres of ammonia, 50 litres of coal tar and 400 m³ of coal gas.

The first oil well in the world was drilled in Pennsylvania, USA in 1859. The second oil well was drilled in Makum, Assam, India in 1867.

Hydrogen – The future fuel. Hydrogen could be the best alternative fuel in the future. It is a clean fuel as it gives out only water while burning. Moreover, it has the highest energy content. It does not pollute air.

Choose the best answer:

1. The chemical mixed with LPG that helps in the detection of its leakage is _____

- (a) Methanol
- (b) Ethanol
- (c) Camphor
- (d) Mercaptan

2. Which is known as syn gas?

- (a) Marsh gas
- (b) Water gas
- (c) Producer gas
- (d) Coal gas

3. The unit of calorific value of fuel is _____

- (a) KJmol^{-1}
- (b) KJg^{-1}
- (c) KJkg^{-1}
- (d) Jkg^{-1}

4. _____ is the coal of superior quality.

- (a) Peat
- (b) Lignite
- (c) Bituminous
- (d) Anthracite

5. The main component of natural gas is _____

- (a) Methane
- (b) Ethane
- (c) Propane
- (d) Butane

Fill in the blanks:

1. Producer gas is a mixture of _____ and _____.
2. _____ is known as marsh gas.
3. The term petroleum means _____.
4. Heating coal in the absence of air is called _____.
5. An example for fossil fuel is _____.

Match the following:

1. Octane rating - diesel
2. Cetane rating - methane
3. Simplest hydrocarbon - petrol
4. Peat - brown in colour
5. Lignite - first stage coal

Answers:

Choose the best answer:

1. mercaptan 2. Water gas 3. KJkg^{-1} 4. Anthracite 5. methane

Fill in the blanks:

1. Carbon Monoxide and Nitrogen 2. Methane 3. Rock oil 4. Destructive distillation 5. Coal

Match the following:

- 1.Octane rating - Petrol
- 2.Cetane rating – Diesel
- 3.Simplest hydrocarbon – Methane
- 4.Peat – First stage coal
- 5.Lignite – Bown in Colour

8th Science Lesson 16**16] Microorganisms****Choose the best answers:**

1. Microorganisms are measured in _____.
 - (a) cm
 - (b) mm
 - (c) micron
 - (d) meter
2. _____ shows both living and nonliving characteristics.
 - (a) Protozoa
 - (b) Virus
 - (c) Bacteria
 - (d) Fungi
3. _____ is a prokaryotic microorganism.
 - (a) Virus
 - (b) Algae
 - (c) Fungi
 - (d) Bacteria
4. Based on shape, the bacteria are classified into _____ types.
 - (a) Two
 - (b) Three
 - (c) Four
 - (d) Five
5. Common cold in human is caused by _____.
 - (a) Plasmodium
 - (b) Influenza
 - (c) Vibrio cholera
 - (d) Aphthovirus

Fill in the blanks:

1. _____ is prepared from a mould called penicillium.
2. _____ are the infectious protein particles.
3. The infecting virus particle found outside the host cell is _____.
4. Microorganism can be seen with the help of a _____.
5. Bacteria, which has a flagellum at one end is classified as _____.

State true or false. If false, correct the statement:

1. Disease causing microorganisms are called pathogens.
2. Female anopheles mosquito is a carrier of dengue virus.
3. Chicken pox is a communicable disease.
4. Citrus canker is transmitted by insects.
5. Yeast is used in the large scale production of alcohol.

Match the following:

1. Nitrogen fixing bacteria - vaccine
2. Tuberculosis - prion
3. Kuru - lactobacillus acidophilus
4. Probiotics - bacteria
5. Edward Jenner – rhizobium

Answers:**Choose the best answers:**

1. micron 2. Virus 3. Bacteria 4. 4 5. Influenza

Fill in the blanks:

1. Penicillin 2. Prions 3. Virion 4. Microscope 5. Monotrichous

State true or false. If false, correct the statement:

1. True
2. False

Correct answer: Female anopheles' mosquito is a carrier of mosquito virus

3. True
4. True
5. True

Match the following:

1. Nitrogen fixing bacteria - Rhizobium
2. Tuberculosis - Bacteria
3. Kuru - Prion
4. Probiotics - Lactobacillus acidophilus
5. Edward Jenner- Vaccine

8th Science Lesson 17

17] Plant Kingdom

Do You Know?

The branch of study of fungus is called mycology.

Claviceps purpuriya is the hallucinogenic fungi which causes greatest damages to the frustrated youth by giving unreal, extraordinary lightness and hovering sensations. Aspergillus species cause allergy to children while cladosporium protects against allergy.

Fungi are placed as third kingdom in R.H. Witterkar's five kingdom of classification because of absence of chlorophyll and starch. Penicillin is known as queen of medicine. It was discovered by Sir. Alexander Fleming in 1928.

Lycopodium, is known as club moss. Equisetum is known as horse tail.

Herbarium is the collection of pressed, dried plants pasted on a sheet and arranged according to any one of the accepted systems of classification.

Largest herbarium of India is in Kolkata, which has more than 10,00,000 (one million) species of herbarium specimens.

The rules and recommendations regarding binomial nomenclature were found in ICBN (international code of Botanical Nomenclature). Now it is known as ICN (International Code of Nomenclature).

Choose the best answers:

1. Solanum trilobatum is the binomial name of Thoothuvalai. The word "Solanum" refers to

- (a) Species
- (b) Genus
- (c) Class
- (d) Orders

2 Floridian starch is a reserve food material of

- (a) Chlorophyceae
- (b) Phaeophyceae
- (c) Rhodophyceae
- (d) Cyanophyceae

3. An example for colonial form of algae is

- (a) Oscillatoria
- (b) Nostoc
- (c) Volvox
- (d) Chlorella

4. One of the following is an edible mushroom

- (a) Polyporus
- (b) Agaricus

(c) Pennicillium

(d) Aspergillus

5. Plants that prevent soil erosion are

(a) Algae

(b) Fungi

(c) Bryophytes

(d) Pteridophytes

6. The first land plants are

(a) Bryophytes

(b) Pteridophytes

(c) Gymnosperm

(d) Angiosperm

7. The well-developed sporophytic plants body is seen in

(a) Bryophytes

(b) Pteridophytes

(c) Gymnosperms

(d) Angiosperms

8. Binominal nomenclature was first introduced in the year

(a) 1970

(b) 1975

(c) 1978

(d) 1623

9. Penicillin is an antibiotic which is extracted from

(a) Algae

(b) Fungi

(c) Bryophytes

(d) Pteridophytes

Fill in the blanks:

1. The word "taconomy" is derived from _____

2. Binominal nomenclature was first introduced by _____

3. The book "genera Plantarum" was published by _____

4. Monocotyledon seed bears only _____ cotyledon.

5. Brown algae belongs to _____ class.

6. Agar is obtained from _____ algae.
7. The reserve food material of fungi are _____ and _____
8. The first true land plants is _____
9. Xylem and phloem are absent in _____ plants.
10. Reticulate venation is present in _____ plants.

State true or false. If false, correct the statement:

1. In polypetalae, the petals are free.
2. Binomial name should contain more than two words.
3. Artificial system of classification is based on a few characters of the plants.
4. Cell wall of fungi is made up of chitin.
5. Pinus is a closed seeded plants.
6. All bryophytes are hydrophytes.
7. Dicotyledons have well developed characters than the gymnosperms.
8. Mosses are the well developed plant in bryophytes.
9. The dominant phase of the bryophytes is sporophyte.
10. The dominant phase of the pteridophyte is gametophytic phase.

Match the following:

Cyanophyceae - Green Algae

Cyanophyceae - Blue green algae

Chlorophyceae - Red algae

Rhodophyceae - Brown algae

Answers:**Choose the best answers:**

1. Genus 2. Rhodophyceae 3. Volvox 4. Agaricus 5. Bryophytes 6. Bryophytes 7. gymnosperms 8. 1623 9. Fungi

Fill in the blanks:

1. Greek 2. Gaspard Bauhin 3. Bentham and Hooker 4. One 5. Phaeophyceae
6. Red 7. Glycogen, oil 8. Pteridophyte 9. Bryophyte 10. Dicot

State true or false. If false, correct the statement:

1. True
2. False
Correct answer: Binomial name should contain two words
3. False
Correct answer: Artificial system of classification is based on a Morphological characters of the plants
4. True
5. False
Correct answer: Pinus is an open seeded plant

6.False

Correct answer: All bryophytes are amphibians

7.False

Correct answer: Monocotyledons have well developed characters than the Dicotyledons

8.True

9.False

Correct answer: The dominant phase of the bryophytes is Gametophyte

10. False

Correct answer: The dominant phase of the pteridophyte is gametophytic phase of bryophyte.

Match the following:

1.Cyanophyceae - Bluegreen algae

2.Chlorophyceae - Green algae

3.Phaeophyceae - Brown algae

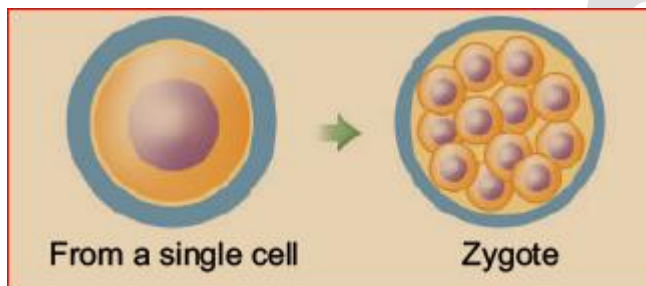
4.Rhodophyceae- Red algae

8th Science Lesson 18

18] Organisation Of Life

Do you know?

Our body is developed from a single cell called zygote. The zygote undergoes continuous mitotic division and forms the foetus consisting multitude of cells of different shape, size and content. Foetal cells gradually attain change in structure and function. This process is known as cell differentiation.



On an average, an adult human being at rest breathes in and out 15-18 times in a minute. During heavy exercise, breathing rate can increase up to 25 times per minute.

Smoking damages lungs. Smoking is also linked to cancer. It must be avoided. When you sneeze, you should cover nose so that the foreign particles you expel are not inhaled by others.

The mixing of foodstuffs and digestive juices in the gut occurs by diffusion. Exchange of respiratory gases (oxygen and carbon dioxide) between blood and tissue fluids between tissue fluid and cells also occurs by diffusion.

Aerobic respiration releases 19 times more energy than anaerobic respiration from the same amount of glucose. In aerobic respiration each glucose molecule produces 36 ATPs.

Basal metabolism refers to the minimum energy required to maintain the normal activities of the body during complete rest in a warm atmosphere, 12-18 hours after the intake of food.

Choose the best answers:

1. _____ is tough and thick white sheath that protects the inner parts of the eye.

(a) Sclera

(b) Conjunctiva

(c) Cornea

(d) Iris

2. _____ Cells are specialised cells that can be transformed into any kind of cells.

(a) Nerve

(b) Stem

(c) Heart

(d) Bone

3. Maintenance of constant internal environment of the body is known as _____

(a) Homeostasis

(b) Homeophytes

(c) Homeokinesis

(d) Homeophilics

4. In the absence of oxygen, glucose is broken down in to _____

(a) Lactic acid

(b) Citric acid

(c) Acetic acid

(d) Nitric acid

5. The process of air passing in and out the lungs are called _____

(a) Inhalation

(b) Exhalation

(c) Breathing

(d) None of these

6. Osmosis is the movement of water molecules from _____

(a) Higher concentration to a region of lower concentration.

(b) Lower concentration to a region of higher concentration.

(c) Neutral

(d) None of these.

7. The erythrocyte is placed in _____ solution which has lesser concentration of solutes and greater concentration of water than in the cytoplasm.

(a) Hypotonic

(b) Hypertonic

(c) Neutral

(d) Acidic

Fill in the blanks:

1. _____ is the structural and functional unit of living organisms.
2. The largest cell is egg of an _____.
3. _____ is a good example for anaerobic respiration.
4. _____ nerve is located at the end of the eyes behind the retina.
5. The size of the cells are measured in units of _____.

Match the following:

1. Carbohydrates - CO₂ Water and heat
2. Glucose - Amino Acid
3. Protein - Glucose
4. Amino acids - Cholesterol and other steroid
5. Fatty acids - Enzymes, hormone, protein

State true or false. If false, correct the statement:

1. In hypotonic condition, concentration of the external and the internal solution of the organism are same.
2. Diffusion is the movement of particles from an area of lower concentration to higher concentration.
3. Human beings are warm blooded in nature.
4. The larynx has fold of tissue which vibrate with the passage of air to produce sound.
5. Aqueous humour plays an important role in maintaining the shape of the eye.

Answers:**Choose the best answers:**

1. Sclera 2. Stem 3. Homeostasis 4. lactic acid 5. Breathing 6. higher concentration to a region of lower concentration 7. Hypotonic

Fill in the blanks:

1. Cell 2. Ostrich 3. Fermentation 4. Optic 5. Microns

Match the following:

1. Carbohydrates - Amino acid
2. Glucose - Glycogen and other sugars
3. Protein - Glucose
4. Amino acids - Enzymes, hormones, proteins
5. Fatty acids - Cholesterol and other steroids-

State true or false. If false, correct the statement:

1. False
Correct answer: concentration of the external solution is less compared to concentration of internal sol.
2. False
Correct answer: Diffusion is the movement of particles from an area of higher concentration to lower concentration
3. True

4.True

5.True

8th Science Lesson 19**19] Movements In Animals****Do You Know?**

Since snakes do not have legs, they use their muscles and their scales to move.

Fish have streamlined body structure which helps them to move smoothly with the flow of water. Muscles and fins on the body and the tail help to keep the balance.

Cheetah can run 76 kilometre per hour. Hippopotamus can run faster than a man. Cockroach is the fastest animal with 6 legs covering a metre per second. The fastest mammal, the Dolphin can swim upto 35 per hours.

Joints are the place where two bones meet or connect. Ligaments are short bands of tough fibrous connective tissues that function to connect one bone to another. Forming the joint. Tendons are made of elastic tissues and they also play a key role in the functioning of joints.

Inflammation of joints is a condition that usually results either due to friction of articulating cartilage or due to lack of synovial fluid in the joint. During this condition, the person feels acute pain in joints particularly while moving joints. This disease is referred to as arthritis. Arthritis is however also caused due to the deposition of uric acid crystals in the joints.

The femur or thighbone is the longest and strongest bone of the human skeleton. The stapes in the middle ear is the smallest and lightest bone of the human skeleton.

Humans and giraffes have the same number of bones in the necks, but the vertebrae in a giraffe's neck are much, much larger.

There are muscles in the root of your hair that give you goose bumps. It takes 17 muscles to smile and 42 muscles to frown. The hardest working muscle is in eye.

Choose the best answers:

1. Which of the following parts of our body help us in movement?

(i) Bones (ii) Skin (iii) Muscles (iv) Organs

Choose the correct answer from the options below:

(a) (i) and (iii)

(b) (ii) and (iv)

(c) (i) and (iv)

(d) (iii) and (ii)

2. Which one of the following organisms lack muscles and skeleton for movement?

(a) Dog

(b) Snail

(c) Earthworm

(d) Human being

3. _____ joints are immovable.

- (a) Shoulder and arm
- (b) Knee and joint
- (c) Upper jaw and skull
- (d) Lower jaw and upper jaw

4. Why do underwater divers wear fin-like flippers on their feet?

- (a) To swim easily in water
- (b) To look like a fish
- (c) To walk on water surface.
- (d) To walk over the bottom of the sea (sea bed).

5. External ear (pinna) is supported by

- (a) Bone
- (b) Cartilage
- (c) Tendon
- (d) Capsule

6. Cockroach moves with the help of its

- (a) Leg
- (b) Bone
- (c) Muscular foot
- (d) Whole body

7. Which one of the following categories of vertebrae are correctly numbered?

- (a) Cervical-7
- (b) Thoracic-10
- (c) Lumbar-4
- (d) Sacral-4

Fill in the blanks:

1. Movement of organisms from place to place is called _____.
2. _____ refers to change in position of the part of an organism's body.
3. A structure which provides rigid frame work to the body is called _____.
4. Axil skeleton in human consists of _____, _____, _____ and _____.
5. Appendicular skeleton in human consists of _____ and _____.
6. The place where two bones meet is termed as _____.
7. _____ is attached to soft parts of the body like blood vessels, iris, bronchi and the skin.

8. _____ muscle makes pupil of eyes wider.

State true or false. If false, correct the statement:

1. Skull in humans consists of 22 bones.
2. There are 12 pairs of ribs in human body.
3. Pelvic girdle is a part of axial skeleton.
4. Hinge joints is slightly movable joint.
5. Cardiac muscle is a voluntary muscle.
6. The flexor and extensor muscle of the arm are antagonistic muscles.

Answers:

Choose the best answers:

1. (i) and (iii) 2. Snail 3. Upper jaw and skull 4. To swim easily in water 5. Cartilage 6. whole body 7. Cervical-7

Fill in the blanks:

1. Locomotion 2. Movement 3. Skeleton 4. Skull facial bone, Sternum, rib, vertebral column
5. Pelvic, Pectoral girdle 6. Joint 7. Smooth muscle 8. Radial

State true or false. If false, correct the statement:

1. True
2. True
3. False
Correct answer: Pelvic girdle is a part of appendicular skeleton
4. True
5. False
Correct answer: Cardiac muscle is an involuntary muscle
6. True

8th Science Lesson 20

20] Reaching The Age Of Adolescence

Do You Know?

Testes and ovaries are called primary sex organs of the male and female respectively.

At puberty, the growth of the larynx is larger in boys than that of girls. The growing voice boys can be seen as a protruding part of the throat called Adam's apple, so that the voice becomes deep and harsh. This is caused mainly by male hormone (regulatory chemicals) during adolescence. As a results of this, muscles (chords) attached to the cartilage get loosened and thickened. When air passes through these loosened and thickened chords a hoarse sound is produced. In girl's larynx is hardly visible from outside because of its small size and the voice becomes high pitched.

The secretions of sweat and sebaceous or subcutaneous glands (oil glands) are very active during adolescence. Many adolescent boys and girls get pimples on face because of increased activity of these glands in the skin. Owing to extra secretions sometimes a distinctive odour is also produced from the bodies.

Estrogen is not a single hormone but a collection of related steroid hormones.

Now-a-days girls attain puberty at very early age. This is due to food habits. As you eat lot of junk food, the body growth increases and it looks like adults.

Sleep is vital to the well-being of adolescents. It can even help you to come out of the stress you experience during this period. During this period about 8 to 10 hours of sleep each night is necessary. But most teens do not have enough sleep which affects their physical and mental health.

Women should take in more iron in their diet regularly to make up for the loss of blood during menstruation.

Choose the best answers:

1. Adolescence is the period of life between _____ years of age.

- (a) 10 to 16
- (b) 11 to 17
- (c) 11 to 19
- (d) 11 to 20

2. The period at which an organism attains sexual maturity is called _____

- (a) Puberty
- (b) Adolescence
- (c) Growth
- (d) Maturity

3. During puberty, the region below the waist become wider in _____

- (a) Boys
- (b) Girls
- (c) Both a and b
- (d) None of these

4. Adam's apple is the growth of the _____

- (a) Pharynx
- (b) Thyroid
- (c) Larynx
- (d) Parathyroid

5. Many adolescent boys and girls get pimples on face, due to the secretions of _____ gland.

- (a) Sweat
- (b) Sebaceous
- (c) Sweat and sebaceous
- (d) None of these.

6. The sperm is produced by _____

- (a) Penis

(b) Ovary

(c) Uterus

(d) Testes

7. _____ are the chemical substances, secreted by endocrine glands.

(a) Hormones

(b) Enzymes

(c) Proteins

(d) Fatty acids

8. Androgen production is regulated by _____

(a) GH hormone

(b) LH Hormone

(c) TSH hormone

(d) ACTH hormone

9. During menstruation, the progesterone level is _____

(a) Decreased

(b) Increased

(c) Ceased

(d) Normal

10. _____ intake needs to be increased to prevent osteoporosis in later life.

(a) Potassium

(b) Phosphorus

(c) Iron

(d) Calcium

Fill in the blanks:

1. _____ is secreted by the ovaries of female.

2. The hormones secreted by the gonads are controlled by _____.

3. Milk secretion during lactation is controlled by _____ hormone.

4. The male and the female gamete fuse together and form. _____.

5. The first menstrual flow begins at puberty and it is termed as _____.

6. _____ usually occurs 14 days after ovulation.

7. _____ includes protein, carbohydrates, fats and vitamins in requisite proportion.

8. _____ helps to prevent thyroid gland related diseases.

9. Iron deficiency leads to _____.

10. In women fertilization takes place at _____.

State true or false. If false, correct the statement:

1. There is a sudden increase in the height of both boys and girls during puberty.
2. The release of ovum from the uterus is called ovulation.
3. During pregnancy, the corpus luteum continues to grow and produces large amount of estrogen and progesterone.
4. Making use of disposable napkins or tampons may increase the chances of infections.
5. Using clean toilets for defecation is a good practice.

Match the following:

Puberty - Testosterone

Adam's apple - Muscle development

Androgen - at 45 to 50 years of age

ICSH - Sexual maturity

Menopause - Change in voice

Answers:

Choose the best answers:

1. 11 to 19 2. Puberty 3. Both a and b 4. Larynx 5. Sebaceous 6. Testes 7. Hormones 8. LH hormone 9. Ceased 10. Calcium

Fill in the blanks:

1. Estrogen 2. Anterior Pituitary 3. Prolactin 4. Zygote 5. Menarche 6. Menstruation
7. Balanced diet 8. Iodine 9. Anaemia 10. Fallopian tube

State true or false. If false, correct the statement:

1. True

2. False

Correct answer: The release of ovum from the ovary is called ovulation

3. True

4. False

Correct answer: Making use of disposable napkins or tampons may decrease the chances of infections.

5. True

Match the following:

1. Puberty- Sexual maturity

2. Adam's apple- Change in voice

3. Androgen- Muscle development

4. ICSH- Testosterone

5. Menopause- at 45 to 50 years of age

21] Crop Production And Management**Do You Know?**

Our country is the largest producer of bananas and mangoes in the world. It is also the second largest producer of wheat and rice.

Transplanting is removal of an actively growing seedling from one place (usually nursery bed) and planting it in the main field for further growth till harvest. Transplanting makes use of pre-grown plants, seedlings or vegetative propagated clones.

The global population is expected to be 9 billion by the year 2050. But, agriculture activities alone utilize 70% of the available fresh water resources. So, efficient and sustainable water use is needed for our own generation and future generations. Drip irrigation is a better solution for economical use of water.

There are over 30000 species of weeds around the world. Out of these 18000 species cause serious losses to crops. The continuous use of the same method leads to building up of tolerant species. Therefore, a suitable combination of different methods of weed control should be practiced.

Food Corporation of India (FCI) was set up on 14th January 1965 at Chennai with the objective of distribution of food grains throughout the country for Public Distribution System (PDS) and maintaining a satisfactory level of operational and buffer stocks of food grains to ensure national food security. Its capital is in New Delhi now.

Leguminous plants have symbiotic relation with the Rhizobium bacteria found in the root nodules of these plants. These plants have the ability to fix atmospheric nitrogen in their roots with the help of these bacteria. The fruits of this plant are called legumes. Examples of legumes include alfalfa, clover, peas, beans, lentils, lupins, mesquite, carob, soy and peanuts. These plants are used in crop rotation to multiply soil nitrogen.

Acharya Jagadish Chandra Bose Indian Botanic Garden located in Kilkatta was earlier called Royal Botanic Garden. This garden exhibits a wide variety of rare plants and a total collection of over 12,000 specimens. The area of this garden spreads over 109 hectares.

Plant shows quick response to the nutrients applied by foliar feedings. The efficiency of nutrients uptake is considered to be higher when nutrients are applied to the leaves, when compared with nutrients applied to soil. A foliar feeding is recommended when environmental conditions limit the uptake of nutrients by roots.

The black knee capsid is an insect found on fruit trees. It eats more than 1000 fruit tree red spider mites per year.

Choose the best answers:

1. The process of placing seeds in the soil is called as

- (a) Ploughing
- (b) Sowing
- (c) Crop production
- (d) Crop rotation

2. Organism that control insects and pests of plant crops is

- (a) Bio-pesticides
- (b) Bio-fertilizers
- (c) Earthworms
- (d) Neem leaves

3. The method in which water flows over the soil surface and allow it to infiltrate is

(a) Irrigation

(b) Surface irrigation

(c) Sprinkler irrigation

(d) Drip irrigation

4. Effective microorganism preparation is not used in

(a) Seed treatment

(b) Foliar spray

(c) Soil treatment

(d) Bio-predators

5. Which of the following is not present in Panchagavya?

(a) Cow dung

(b) Cow's urine

(c) Curd

(d) Sugar

Fill in the blanks:

1. The process of actively growing seedling from one place and planting in the main field for further growth is called _____.

2. _____ is a plant growing in a place where it is not wanted.

3. The chemicals used for killing the weeds or inhibiting their growth are called as _____.

4. _____ seeds transfer their unique characteristics to the descents.

5. _____ centres serve as the ultimate link between ICAR and farmers.

6. Several popular high yielding varieties of major crops have been developed by _____.

Match the following:

1. Bio – pesticide - Neem leaves

2. Bio – predators - bacillus thuringiensis

3. Bio – fertilizer - Control white flies

4. Bio – Indicators - Improve soil fertility

5. Bio – repellants - Quality of environment

Answers:

Choose the best answers:

1. sowing 2. bio-pesticides 3. surface irrigation 4. seed treatment 5. Sugar

Fill in the blanks:

1. Transplantation 2. Weed 3. Herbicide 4. Heirloom seeds 5. Krishi Vigyan Kendra 6. IARI

Match the following:

1. Bio-pesticide- *Bacillus thuringiensis*
2. Bio-predators- Control white flies
3. Bio-fertilizer- Improve soil fertility
4. Bio-indicators- Quality of environment
5. Bio-repellants- Neem Leaves

8th Science Lesson 22**22] Conservation Of Plants And Animals****Do You Know?**

Chipko Movement is primarily a forest conservation movement. The word "Chipko" means "to Stick" or "to hug". Sunderlal Bahuguna was the founder of this movement. It was started in 1970s with the aim of protecting and conserving trees and preserving forest from being destroyed.

Long distance travel by birds to escape severe environmental conditions is called migration. Many birds and many other animals migrate long distances during unfavourable season. Siberian Crane migrates from Siberia to India during winters to escape harsh conditions in Siberia and to get comfortable conditions and food in India. Siberian crane, on an average can travel 200 miles in a single day.

Amazon forest is the largest rain forest in the world, located in Brazil. It covers 6000000 square km. it helps to stabilize the earth's climate and slow global warming by fixing CO_2 , and producing 20% of the world's oxygen in the process. It has about 390 billion trees. It is the lungs of the planet.

The term social forestry was first used in 1976 by the then National Commission on Agriculture, Government of India. It means the management and protection of forests and afforestation on barren land with the purpose of helping the environment, social and rural development. It is to raise the plantations thereby reducing the pressure on the traditional forest area.

Wangari Maathai founded the Green Belt Movement in Kenya in the year 1977. GBM has planted over 51 million trees in Kenya. She was awarded the Nobel Peace Prize for 2004.

Each year, 22nd May is celebrated as World Biodiversity Day. Biodiversity is a term used to describe the different plants, animals, marine life, microorganisms, insects, habitats, ecosystem etc. that make our plant so unique and so fascinating.

Yeoman Butterfly has been declared state butterfly of Tamil Nadu. This species is endemic to Western Ghats. It is among 32 butterfly species found in Western Ghats.

At one-time Dinosaur, ferns and some gymnosperms were wide spread on the earth, may be due to shortage of space and food or due to climatic change.

Planting the native trees like Neem tree, Umbrella tree and Banyan tree in our surrounding will be helpful for the animals. Many birds and animals find shelter in those trees.

WWF-World Wildlife Fund. ZSI-Zoological survey of India. BRP-Biosphere Reserve Programme. CPCB-Central Pollution Control Board. IUCN-International Union for Conservation of Nature.

World Wildlife Day is observed on March 3rd every year.

The oldest zoo is Schoenbrunn Zoo in Vienna, established in the year 1759. In India the first Zoo was established in Barrachpur in the year 1800.

Blue cross was founded to care for working horses on the streets of London, UK. It opened its first animal hospital, in Victoria, London, on 15 May 1906.

Dr.K. Sakhila Banu, a scientist from Texas A&M University, USA has found out that the water contaminated by chromium metal induces infertility in female species and also causes oxidative stress in the human placenta which could affect the growth of the baby. She is from Pudupattinam Village in Ramnad district, Tamil Nadu.

Choose the best answers:

1. The plants found in a particular area are known as _____

- (a) Fauna
- (b) Flora
- (c) Endemic
- (d) Rare

2. Deforestation means _____

- (a) Cleaning of forest
- (b) To grow plants
- (c) To look after plants
- (d) None of these.

3. The Red Data Book gives a list of _____

- (a) Endemic species
- (b) Extinct species
- (c) Natural Species
- (d) None of these

4. Institute conservation is _____

- (a) Off site conservation
- (b) On site conservation
- (c) Both a and b
- (d) None of these

5. Wildlife protection act was implemented in _____

- (a) 1986
- (b) 1972
- (c) 1973
- (d) 1971

Fill in the blanks:

1. WWF stands for _____

2. The animal found in a particular area is known as _____

3. Red Data Book is maintained by _____

4. Mudhumalai Wildlife Sanctuary is located in _____ district.

5. _____ is observed as "world Wildlife Day".

Match the following:

Gir National Park - Madhya Pradesh

Sundarabans National Park - Uttara Khand

Indira Gandhi National Park - West Bengal

Corbett National Park - Gujarat

Kanha National Park - Tamil Nadu

Answers:

Choose the best answers:

1. endemic 2. cleaning of forest 3. Threatened species 4. on site conservation 5. 1972

Fill in the blanks:

1. World Wildlife Fund 2. Endemic 3. IUCN 4. Nilgiris 5. March 3

Match the following:

1. Gir National Park - Gujarat

2. Sundarabans National Park - West Bengal

3. Indira Gandhi National Park - Tamil Nadu

4. Corbett National Park - Uttara Khand

5. Kanha National Park - Madhya Pradesh

8th Science Lesson 23

23] Libre Office Calc

Choose the best answers:

1. All functions begin with an _____ sign

(a) =

(b) -

(c) >

(d) }

2. _____ function is used to calculate the total of a given set of values.

(a) Average

(b) Sum

(c) Min

(d) Max

3. The _____ character is used in text formula.

(a) Ampersand

(b) Comma

(c) Exclamation

(d) Hyperlink

4. Which of the following is a relational operator?

(a) +

(b) >

(c) –

(d) NOT

5. The _____ function returns the smallest value in a set of values.

(a) Average

(b) Sum

(c) Min

(d) Max

Answers:

Choose the best answers:

1. = 2. Sum 3. Ampersand 4. > 5. Min

9th Science Lesson 1

1] Measurement

Do You Know?

The nearest star alpha centauri is about 1.34 parsec from the sun. Most of the stars visible to the unaided eye in the night sky are within 500 parsec distance from the sun.

Mass of 1 ml of water = 1 g. Mass of 1 l of water = 1kg. Mass of the other liquids vary with their density.

Problem 1: Calculate the correct reading, if the main scale reading is 8 cm, vernier coincidence is 4 and positive zero error is 0.05 cm.

Solution: Correct reading = 8 cm + (4 x 0.01 cm) – 0.05 cm = 8 + 0.04 – 0.05 = 8 – 0.01 = 7.99 cm.

Problem 2: The main scale reading is 8 cm and vernier coincidence is 4 and negative zero error is 0.02 cm. Then calculate the correct reading.

Solution: Correct reading = 8 cm + (4 x 0.01 cm) + (0.02 cm) = 8 + 0.04 + 0.02 = 8.06 cm.

The shell of an egg is 12% of its mass. A blue whale can weigh as much as 30 elephants and it is as long as 3 larger tour buses.

Problem 3: If a man has a mass 50 kg on the earth, then what is his weight?

Solution: Weight (w) = mg

Mass of a man = 50 kg

His weight = 50×9.8

$w = 490$ newton.

Choose the best answers:

1. Choose the correct one.

(a) $\text{mm} < \text{cm} < \text{m} < \text{km}$

(b) $\text{mm} > \text{cm} > \text{m} > \text{km}$

(c) $\text{km} < \text{m} < \text{cm} < \text{mm}$

(d) $\text{mm} > \text{m} > \text{cm} > \text{km}$

2. Rulers, measuring tapes and metre scales are used to measure

(a) Mass

(b) weight

(c) time

(d) length

3. 1 metric ton is equal to

(a) 100 quintals

(b) 10 quintals

(c) $1/10$ quintals

(d) $1/100$ quintals

4. Which among the following is not a device to measure mass?

(a) Spring balance

(b) Beam balance

(c) Physical balance

(d) Digital balance

Fill in the blanks:

1. Metre is the unit of _____.

2. 1 kg of rice is weighed by _____.

3. Thickness of a cricket ball is measured by _____.

4. Radius of a thin wire is measured by _____.

5. A physical balance measures small differences in mass up to _____.

State true or false. If false, correct the statement:

1. The SI unit of electric current is kilogram.
2. Kilometre is one of the SI units of measurement.
3. In everyday life, we use the term weight instead of mass.
4. A physical balance is more sensitive than a beam balance.
5. One Celsius degree is an interval of 1 K and zero degree Celsius is 273.15 K.
6. With the help of vernier calliper we can have an accuracy of 0.1 mm and with screw gauge we can have an accuracy of 0.01 mm.

Match the following:

(a)

1. Length - Kelvin
2. Mass - metre
3. Time - kilogram
4. Temperature - second

(b)

1. Screw gauge - vegetables
2. Vernier calliper - coins
3. Beam balance - gold ornaments
4. Digital balance - cricket ball

Consider the statements given below and choose the correct option:

- (a) Both A and R are true but R is not the correct reason.
- (b) Both A and R are true and R is the correct reason.
- (c) A is true but R is false.
- (d) A is false but R is true.

1. Assertion (A) : The scientifically correct expression is "The mass of the bag is 10 kg"

Reason (R) : In everyday life, we use the term weight instead of mass.

2. Assertion (A) : $0^{\circ}\text{C} = 273.16\text{ K}$. For our convenience we take it as 273 K after rounding off the decimal.

Reason (R) : To convert a temperature on the Celsius scale we have to add 273 to the given temperature.

3. Assertion (A) : Distance between two celestial bodies is measured in terms of light year.

Reason (R) : The distance travelled by the light in one year is one light year.

Answers:

Choose the best answers:

1. mm < cm < m < km 2. Lengths 3. 10 quintals 4. Spring balance

Fill in the blanks:

1. Length 2. Beam balance 3. Vernier Caliper 4. Screw gauge 5. 1 mg

State true or false. If false, correct the statement:

1.False

Correct answer: The SI unit of electric current is Ampere

2.False

Correct answer: Metre is one of the SI units of measurement

3.True

4.True

5.False

Correct answer: One Celsius degree is an interval of 1K and zero degree Celsius is – 273.15 K

6.False

Correct answer: With the help of vernier caliper we can have an accuracy of 0.01 cm and with screw gauge we can have an accuracy of 0.01 mm

Match the following:

a)

1.Length- metre

2.Mass- kilogram

3.Time- second

4.Temperature- Kelvin

b)

1.Screw gauge- Coins

2.Vernier caliper- Cricket ball

3.Beam balance- Vegetables

4.Digital balance- Gold ornaments

Consider the statements given below and choose the correct option:

1.Both A and R are true but R is not the correct reason

2.Both A and R are true and R is the correct reason

3.Both A and R are true and R is the correct reason

9th Science Lesson 2**2] Motion****Do You Know?**

Problem 1: An object travels 16 m in 4 s and then another 16 m in 2 s. What is the average speed of the object?

Solution: Total distance travelled by the object = 16 m + 16 m = 32 m

Total time taken = 4s + 2s = 6s

Average speed = Total distance travelled / Total time taken = 32m/6s = 5.33 ms⁻¹

Therefore, the average speed of the object is 5.33 ms^{-1} .

Problem 2: A sound is heard 5 s later than the lightning is seen in the sky on a rainy day. Find the distance of location of lightning? Given the speed of sound = 346 ms^{-1}

Solution: Speed = Distance/Time

$$\text{Distance} = \text{Speed} \times \text{Time} = 346 \times 5 = 1730 \text{ m}$$

Thus, the distance of location of lightning is 1730 m.

The speedometer of an automobile measures the instantaneous speed of the automobile. In a uniform motion in one dimension, the average velocity is equal to instantaneous velocity. Instantaneous velocity is also called velocity or instantaneous speed or simply speed.

Problem 3: The brakes applied to a car produce an acceleration of 6 ms^{-2} in the opposite direction to the motion. If the car takes 2 s to stop after the application of brakes, calculate the distance travelled during this time.

Solution: We have been given $a = -6 \text{ ms}^{-2}$, $t = 2\text{s}$ and $v = 0$

From the equation of motion,

$$V = u + at$$

$$0 = u + (-6 \times 2)$$

$$0 = u - 12 \therefore u = 12 \text{ ms}^{-1}$$

$$S = ut + \frac{1}{2}at^2$$

$$= (12 \times 2) + \frac{1}{2}(-6 \times 2 \times 2) = 24 - 12 = 12 \text{ m}$$

Thus, the car will move 12 m before it stops after the application of brakes.

Can a body have zero velocity and finite acceleration? Yes, when a body is thrown vertically upwards in space, at the highest point, the body has zero velocity but it has acceleration due to the gravity.

Problem 4: A 900 kg car moving at 10 ms^{-1} takes a turn around a circle with a radius of 25 m. Determine the acceleration and the net force acting upon the car.

Solution: When the car turns around circle, it experiences centripetal acceleration, $a = v^2/r$

$$a = (10)^2/25 = 100/25 = 4 \text{ ms}^{-2}$$

$$\text{Net force acting upon the car, } F = m a = 900 \times 4 = 3600 \text{ N}$$

Any force like gravitational force, frictional force, magnetic force, electrostatic force etc., may act as centripetal force.

When you go for a ride in a merry-go-round in amusement parks, you will experience an outward pull as merry-go round rotates about vertical axis. This is due to centrifugal force.

Choose the best answers:

1. The area under velocity – time graph represents the

(a) Velocity of the moving object

(b) Displacement covered by the moving object

(c) Speed of the moving object

(d) Acceleration of the moving object

2. Which one of the following is most likely not a case of uniform circular motion?

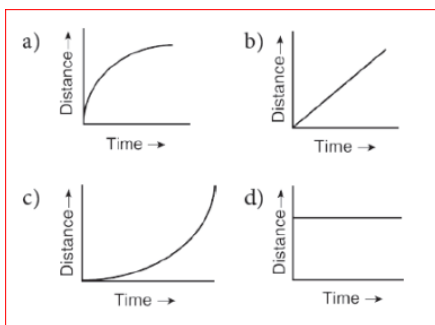
(a) Motion of the Earth around the Sun

(b) Motion of the toy train on a circular track

(c) Motion of a racing car on a circular track

(d) Motion of hours' hand on the dial of the clock

3. Which of the following graph represents uniform motion of a moving particle?



4. The centrifugal force is

(a) A real force

(b) the force of reaction of centripetal force

(c) A virtual force

(d) directed towards the centre of the circular path

Fill in the blanks:

1. Speed is a _____ quantity whereas velocity is a _____ quantity.

2. The slope of the distance – time graph at any point gives _____.

3. Negative acceleration is called _____.

4. Area under velocity – time graph shows _____.

State true or false. If false, correct the statement:

1. The motion of a city bus in a heavy traffic road is an example for uniform motion.

2. Acceleration can get negative value also.

3. Distance covered by a particle never becomes zero but displacement becomes zero.

4. The velocity – time graph of a particle falling freely under gravity would be a straight line parallel to the x axis.

5. If the velocity – time graph of a particle is a straight line inclined to X-axis then its displacement – time graph will be a straight line.

Consider the statements given below and choose the correct option:

- (a) If both assertion and reason are true and reason is the correct explanation of assertion
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion
- (c) If assertion is true but reason is false
- (d) If assertion is false but reason is true

1. Assertion: The accelerated motion of an object may be due to change in magnitude of velocity or direction or both of them.

Reason: Acceleration can be produced only by change in magnitude of the velocity. It does not depend the direction.

2. Assertion: The speedometer of a car or a motor-cycle measures its average speed.

Reason: Average velocity is equal to total displacement divided by total time taken.

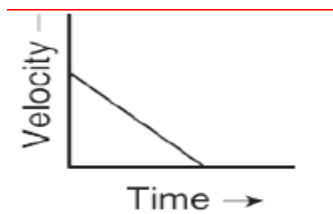
3. Assertion: Displacement of a body may be zero when distance travelled by it is not zero.

Reason: The displacement is the shortest distance between initial and final position.

Match the following:

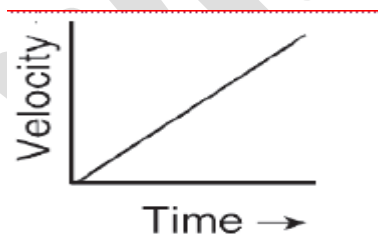
List I List II

1. Motion of a body covering equal distances in equal interval of time



-a)

2. Motion with non uniform acceleration



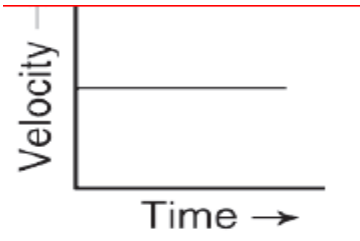
-b)

3. Constant retardation



-c)

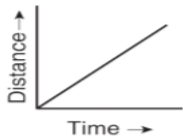
4. Uniform acceleration



-d)

Answers**Choose the best answers:**

1. acceleration of the moving object 2. Motion of the Earth around the Sun.



3.

4. a virtual force

Fill in the blanks:

1. Scalar, vector 2. Speed 3. Retardation or deceleration 4. Displacement

State true or false. If false, correct the statement:

1.False

Correct answer: The motion of a city bus in a heavy traffic road is an example for non- uniform motion.

2.True

3.True

4.False

Correct answer: The velocity – time graph of a particle falling freely under gravity would be a curved line

5.True

Consider the statements given below and choose the correct option:

1.If assertion is true but reason is false

2.If assertion is false but reason is true

3.If both assertion and reason are true and reason is the correct explanation of assertion

Match the following:

1.d

2.c

3.a

4.b

9th Science Lesson 3

3] Fluids

Do You Know?

If a single nail pricks our body it is very painful. How is it possible for people to lie down on a bed of nails, still remain unhurt? It is because, area of contact is more.

Problem 1: A man whose mass is 90 kg stands on his feet on a floor. The total area of contact of his two feet with the floor is 0.036 m^2 (Take, $g = 10 \text{ ms}^{-2}$). How much is the pressure exerted by him on the floor?

Solution: The weight of the man (thrust), $F = mg = 90 \text{ kg} \times 10 \text{ ms}^{-2} = 900 \text{ N}$

Pressure, $P = F/A = 900 \text{ N}/0.036 \text{ m}^2 = 25000 \text{ Pa}$

Problem 2: Calculate the pressure exerted by a column of water of height 0.85 m (density of water, $\rho_w = 1000 \text{ kg m}^{-3}$) and kerosene of same height (density of kerosene, $\rho_k = 800 \text{ kg m}^{-3}$)

Solution: Pressure due to water = $h\rho_w g = 0.85 \text{ m} \times 1000 \text{ kg m}^{-3} \times 10 \text{ ms}^{-2} = 8500 \text{ Pa}$

Pressure due to kerosene = $h\rho_k g = 0.85 \text{ m} \times 800 \text{ kg m}^{-3} \times 10 \text{ ms}^{-2} = 6800 \text{ Pa}$.

Human lung is well adapted to breathe at a pressure of sea level (101.3 k Pa). As the pressure falls at greater altitudes, mountain climbers need special breathing equipments with oxygen cylinders. Similar special equipments are used by people who work in mines where the pressure is greater than that of sea level.

Problem 3: A mercury barometer in a physical laboratory shows a 732 mm vertical column of mercury. Calculate the atmospheric pressure in pascal. [Given density of mercury, $\rho = 1.36 \times 10^4 \text{ kg m}^{-3}$, $g = 9.8 \text{ ms}^{-2}$].

Solution: Atmospheric pressure in the laboratory, $P = h\rho g = 732 \times 10^{-3} \times 1.36 \times 10^4 \times 9.8 = 9.76 \times 10^4 \text{ Pa}$ (or) $0.976 \times 10^5 \text{ Pa}$.

In petrol bunks, the tyre pressure of vehicles is measured in a unit called psi. It stands for pascal per inch, an old system of unit for measuring pressure.

Problem 4: A hydraulic system is used to lift a 2000 kg vehicle in an auto garage. If the vehicle sits on a piston of area 0.5 m^2 , and a force is applied to a piston of area 0.03 m^2 , what is the minimum force that must be applied to lift the vehicle?

Given: Area covered by the vehicle on the piston $A_1 = 0.5 \text{ m}^2$

Solution: $P_1 = P_2$; $F_1/A_1 = F_2/A_2$ and $F_2 = F_1/A_1 \times A_2$;

$F_2 = (2000 \times 9.8) \times 0.03/0.5 = 1176 \text{ N}$

Problem 5: You have a block of a mystery material, 12 cm long, 11 cm wide and 3.5 cm thick. Its mass is 1155 grams. (a) What is its density? (b) Will it float in a tank of water, or sink?

Solution: (a) Density = Mass/Volume = $1155 \text{ g}/12 \text{ cm} \times 11 \text{ cm} \times 3.5 \text{ cm} = 1155 \text{ g}/462 \text{ cm}^3 = 2.5 \text{ g cm}^{-3}$

(b) The mystery material is denser than the water. So it sinks.

Salt water provides more buoyant force than fresh water, because, buoyant force depends as much on the density of fluids as on the volume displaced.

Flotation therapy uses water that contains Epsom salts rich in magnesium. As a floater relaxes, he or she is absorbing this magnesium through the skin. Magnesium helps the body to process insulin, which lowers a person's risk of developing Type 2 Diabetes.

Choose the best answers:

1. The size of an air bubble rising up in water

- (a) Decreases
- (b) Increases
- (c) Remains same
- (d) May increase or decrease

2. Clouds float in atmosphere because of their low

- (a) Density
- (b) Pressure
- (c) Velocity
- (d) Mass

3. In a pressure cooker, the food is cooked faster because

- (a) Increased pressure lowers the boiling point
- (b) Increased pressure raises the boiling point
- (c) Decreased pressure raises the boiling point
- (d) Increased pressure lowers the melting point

4. An empty plastic bottle closed with an airtight stopper is pushed down into a bucket filled with water. As the bottle is pushed down, there is an increasing force on the bottom. This is because,

- (a) More volume of liquid is displaced
- (b) More weight of liquid is displaced
- (c) Pressure increases with depth
- (d) All the above

Fill in the blanks:

1. The weight of the body immersed in a liquid appears to be _____ than its actual weight.
2. The instrument used to measure atmospheric pressure is _____.
3. The magnitude of buoyant force acting on an object immersed in a liquid depends on _____ of the liquid.
4. A drinking straw works on the existence of _____.

State true or false. If false, correct the statement:

1. The weight of fluid displaced determines the buoyant force on an object.
2. The shape of an object helps to determine whether the object will float or not.
3. The foundations of high-rise buildings are kept wide so that they may exert more pressure on the ground.
4. Archimedes' principle can also be applied to gases.
5. Hydraulic press is used in the extraction of oil from oil seeds.

Match the following:

1. Density - $h\rho g$
2. 1 gwt - milk
3. Pascal's law - mass / volume
4. Pressure exerted by a fluid - pressure
5. Lactometer - 980 dyne

Consider the statements given below and choose the correct option:

- (a) If both assertion and reason are true and reason is the correct explanation of assertion
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion
- (c) If assertion is true but reason is false
- (d) If assertion is false but reason is true

1. Assertion: To float, body must displace liquid whose weight is equal to the actual weight.

Reason: The body will experience no net downward force in that case.

2. Assertion: Pascal's law is the working principle of a hydraulic lift.

Reason: Pressure is thrust per unit area.

Answers:**Choose the best answers:**

1. decreases 2. Density 3. increased pressure lowers the boiling point 4. All the above

Fill in the blanks:

1. Less 2. Barometer 3. Density 4. Pressure

State true or false. If false, correct the statement:

1. True
2. True
3. True
4. False

Correct answer: Archimedes' principle cannot be applied to gases

5. True

Match the following:

1. Density- Mass/ volume
2. gwt- 980 dyne
3. Pascal's law- Pressure
4. Pressure exerted by a fluid- hpg
5. Lactometer- milk

Consider the statements given below and choose the correct option:

1. If both assertion and reason are true and reason is the correct explanation of assertion
2. If both assertion and reason are true but reason is not the correct explanation of assertion

9th Science Lesson 4**4] Electric Charge And Electric Current****Do You Know?**

Problem 1: How many electrons will be there in one coulomb of charge?

Solution: Charge on 1 electron, $e = 1.6 \times 10^{-19} \text{ C}$ $q = ne$ or $n = q/e$

\therefore Number of electrons in 1 coulomb $= 1/1.6 \times 10^{-19} = 6.25 \times 10^{18}$ electrons.

Electrostatic forces between two point charges obey Newton's third law. The force on one charge is the action and on the other is reaction and vice versa.

Problem 2: If, 25 C of charge is determined to pass through a wire of any cross section in 50 s, what is the measure of current?

Solution: $I = q/t = (25 \text{ C}) / (50 \text{ s}) = 0.5 \text{ C/s} = 0.5 \text{ A}$.

Problem 3: The current flowing through a lamp is 0.2 A. If the lamp is switched on for one hour, what is the total electric charge that passes through the lamp?

Solution: $I = q/t$; $q = I \times t$

1 hr = 1 x 60 x 60 s = 3600 s

$q = I \times t = 0.2 \text{ A} \times 3600 \text{ s} = 720 \text{ C}$

Problem 4: The e.m.f of a cell is 1.5 V. What is the energy provided by the cell to drive 0.5 C. of charge around the circuit?

Solution: $\varepsilon = 1.5 \text{ V}$ and $q = 0.5 \text{ C}$

$\varepsilon = W/q$; $W = \varepsilon \times q$; Therefore, $W = 1.5 \times 0.5 = 0.75 \text{ J}$.

Problem 5: A charge of $2 \times 10^4 \text{ C}$ flows through an electric heater. The amount of electrical energy converted into thermal energy is $5 \times 10^6 \text{ J}$. Compute the potential difference across the ends of the heater.

Solution: $V = W/q$ that is $5 \times 10^6 \text{ J} / 2 \times 10^4 \text{ C} = 250 \text{ V}$

Difference between e.m.f and potential difference:

As both e.m.f and potential difference are measured in volt, they may appear the same. But they are not. The e.m.f refers to the voltage developed across the terminals of an electrical source when it does not produce current in the circuit. Potential difference refers to the voltage developed between any two points (even across electrical devices) in an electric circuit when there is current in the circuit.

The heating effect and the chemical effect experiments have to be performed only with a dc cell of around 9 V. Students at any cost should not use the main domestic electric supply which is a 220 V ac voltage. If it is used it will give a heavy electric shock leading to a severe damage to our body.

Extremely weak electric current is produced in the human body by the movement of charged particles. These are called synaptic signals. These signals are produced by electro-chemical process. They travel between brain and the organs through nervous system.

In India, the voltage and frequency of ac used for domestic purpose is 220 V and 50 Hz respectively where as in United States of America it is 110 V and 60 Hz respectively.

Resistance of a dry human body is about 1,00,000 ohms. Because of the presence of water in our body the resistance is reduced to few hundred ohms. Thus, a normal human body is a good conductor of electricity. Hence, precautions are required while doing electrical work.

Choose the best answers:

1. In current electricity, a positive charge refers to

- (a) Presence of electron
- (b) Presence of proton
- (c) Absence of electron
- (d) Absence of proton

2. Rubbing of comb with hair

- (a) Creates electric charge
- (b) Transfers electric charge
- (c) Either (a) or (b)
- (d) Neither (a) nor (b)

3. Electric field lines _____ from positive charge and _____ in negative charge.

- (a) Start; Start
- (b) Start; end
- (c) Start; end
- (d) end; end

4. Potential near a charge is the measure of its _____ to bring a positive charge at that point.

- (a) Force
- (b) Ability

(c) Tendency

(d) Work

5. Heating effect of current is called

(a) Joule heating

(b) Coulomb heating

(c) Voltage heating

(d) Ampere heating

6. In an electrolyte the current is due to the flow of

(a) Electrons

(b) Positive ions

(c) Both (a) and (b)

(d) Neither (a) nor (b)

7. Electroplating is an example for

(a) Heating effect

(b) Chemical effect

(c) Flowing effect

(d) Magnetic effect

8. Resistance of a wire depends on

(a) Temperature

(b) Geometry

(c) Nature of material

(d) All the above

Match the following:

1. Electric charge - ohm

2. Potential difference - ampere

3. Electric field - coulomb

4. Resistance - Newton per coulomb

5. Electric current - volt

State true or false. If false, correct the statement:

1. Electrically neutral means it is either zero or equal positive and negative charges.

2. Ammeter is connected in parallel in any electric circuit.

3. The anode in electrolyte is negative.

4. Current can produce magnetic field.

Fill in the blanks:

1. Electrons move from _____ potential to _____ potential.

2. The direction opposite to the movement of electron is called _____ current.

3. The e.m.f of a cell is analogous to _____ of a pipe line.

4. The domestic electricity in India is an ac with a frequency of _____ Hz.

Answers:

Choose the best answers:

1. absence of proton 2. either (a) or (b) 3. start; end 4. Work 5. Joule heating 6. Electrons 7. chemical effect 8. All the above

Match the following:

1. Electric charge - coulomb

2. Potential difference - Volt

3. Electric field - newton per coulomb

4. Resistance - ohm

5. Electric current - Ampere

State true or false. If false, correct the statement:

1. True

2. False

Correct answer: Ammeter is connected in series in any electric circuit

3. False

Correct answer: The anode in electrolyte is positive

4. True

Fill in the blanks:

1. Higher, lower 2. Conventional 3. A pump 4. 50

9th Science Lesson 5

5] Magnetism And Electromagnetism

Do You Know?

Some sea turtles (loggerhead sea turtle) return to their birth beach many decades after they were born, to nest and lay eggs. In a research, it is suggested that the turtles can perceive variations in magnetic parameters of Earth such as magnetic field intensity and remember them. This memory is what helps them in returning to their homeland.

Problem 1: A conductor of length 50 cm carrying a current of 5 A is placed perpendicular to a magnetic field of induction 2×10^{-3} T. Find the force on the conductor.

Solution: Force on the conductor = $ILB = 5 \times 50 \times 10^{-2} \times 2 \times 10^{-3} = 5 \times 10^{-3}$ N

Problem 2: A current carrying conductor of certain length, kept perpendicular to the magnetic field experiences a force F. What will be the force if the current is increased four times, length is halved and magnetic field is triples?

Solution: $F = I L B = (4I) \times (L/2) \times (3 B) = 6 F$. Therefore, the force increases six times.

Michael Faraday (22nd Sep, 1791 – 25th Aug, 1867) was a British Scientist who contributed to the study of electromagnetism and electrochemistry. His main discoveries include the principles underlying electromagnetic induction, diamagnetism and electrolysis.

A step up transformer increases the voltage but it decreases the current and vice versa. Basically there will be loss of energy in a transformer in the form of heat, sound etc.

Problem 3: The primary coil of a transformer has 800 turns and the secondary coil has 8 turns. It is connected to a 220 V ac supply. What will be the output voltage?

Solution: In a transformer, $E_S / E_P = N_S / N_P$

$E_S = N_S / N_P \times E_P = 8/800 \times 220 = 220/100 = 2.2$ volt.

Choose the best answers:

1. Which of the following converts electrical energy into mechanical energy?

- (a) Motor
- (b) Battery
- (c) Generator
- (d) Switch

2. Transformer works on

- (a) AC only
- (b) DC only
- (c) Both AC and DC

3. The part of the AC generator that passes the current from the armature coil to the external circuit is

- (a) Field magnet
- (b) Split rings
- (c) Slip rings
- (d) Brushes

4. The unit of magnetic flux density is

- (a) Weber

(b) Weber/meter

(c) Weber/meter²

(d) Weber.meter²

Fill in the blanks:

1. The SI unit of magnetic field induction is _____.
2. Devices which is used to convert high alternating current to low alternating current is _____.
3. An electrical motor converts _____.
4. A device for producing electric current is _____.

Match the following:

1. Magnetic material - Oersted
2. Non-magnetic material - Iron
3. Current and magnetism - Induction
4. Electromagnetic induction - Wood
5. Electric generator - Faraday

State true or false. If false, correct the statement:

1. A generator converts mechanical energy into electrical energy.
2. Magnetic field lines always repel each other and do not intersect.
3. Fleming's Left hand rule is also known as Dynamo rule.
4. The speed of rotation of an electric motor can be increased by decreasing the area of the coil.
5. A transformer can step up direct current.
6. In a step down transformer the number of turns in primary coil is greater than that of the number of turns in the secondary coil.

Answers:

Choose the best answers:

1. Motor 2. AC only 3. Brushes 4. Weber/meter²

Fill in the blanks:

1. Tesla 2. Step down transformer 3. Electrical energy into Mechanical energy 4. Generator

Match the following:

1. Magnetic material - Iron
2. Non-magnetic material - Wood
3. Current and magnetism - Oersted
4. Electromagnetic induction - Faraday

5. Electric generator- Induction

State true or false. If false, correct the statement:

1. True
2. True
3. True
4. False

Correct answer: The speed of rotation of an electric motor can be increased by increasing the area of the coil

5. False

Correct answer: A transformer can step up alternating current

6. True

9th Science Lesson 6**6] Light****Do You Know?**

The most common usage of mirror writing can be found on the front of ambulances, where the word "AMBULANCE" is often written in very large mirrored text.

Problem 1: Find the size, nature and position of the image formed when an object of size 1 cm is placed at a distance of 15 cm from a concave mirror of focal length 10 cm.

Solution: Object distance, $u = -15$ cm (to the left of mirror)

Image distance, $v = ?$

Focal length, $f = -10$ cm (concave mirror)

Using mirror formula, $1/v + 1/u = 1/f$

$$1/v + 1/-15 = 1/-10$$

$$1/v - 1/15 = -1/10$$

$$1/v = -1/10 + 1/15 = -3+2/30 = -1/30$$

Thus, image distance, $v = -30$ cm (negative sign indicates that the image is on the left side of the mirror).

∴ Position of image is 30 cm in front of the mirror. Since the image is in front of the mirror, it is real and inverted.

To find the size of the image, we have to calculate the magnification.

$$m = -v/u = -(-30) / (-15) = -2$$

We know that, $m = h_2/h_1$

Here, height of the object $h_1 = 1$ cm

$$-2 = h_2/1$$

$$h_2 = -2 \times 1 = -2 \text{ cm}$$

The height of images is 2 cm (negative sign shows that the image is formed below the principle axis).

Problem 2: An object 2 cm high is placed at a distance of 16 cm from a concave mirror which produces a real image 3 cm high. Find the position of the image.

Solution: Height of object $h_1 = 2$ cm

Height of real image $h_2 = -3$ cm

Magnification $m = h_2/h_1 = -3/2 = -1.5$

We know that, $m = -v/u$

Here, object distance $u = -16$ cm

Substituting the value, we get

$$-1.5 = -v / (-16)$$

$$-1.5 = v/16$$

$$v = 16 \times (-1.5) = -24 \text{ cm}$$

The position of image is 24 cm in front of the mirror (negative sign indicates that the image is on the left side of the mirror).

Stellar objects are at an infinite distance. Therefore, the image formed by a concave mirror would be diminished and inverted. Yet, astronomical telescopes use concave mirrors.

In the rear view mirror, the following sentence is written. "Objects in the mirror are closer than they appear". Why?

Problem 3: A car is fitted with a convex mirror of focal length 20 cm. Another car is 6 m away from the first car. Find the position of the second car as seen in the mirror of the first. What is the size of the image if the second car is 2 m broad and 1.6 m high?

Solution: Focal length = 20 cm (convex mirror)

Object distance = -6 m = -600 cm

Image distance $v = ?$

$$1/f = 1/u + 1/v$$

$$1/20 = 1/-600 + 1/v$$

$$1/v = 1/20 - 1/-600 = 1/20 + 1/600 \quad 1/v = 30+1/600 = 31/600$$

$$v = 600/31 = 19.35 \text{ cm}$$

(b) Size of the image

$$m = -v/u = -v / (-u) = 600/31 \times 1/-600 = 1/31$$

$$\text{Breadth of image} = 1/31 \times 200 \text{ cm} = 6.45 \text{ cm}$$

$$\text{Height of image} = 1/31 \times 160 \text{ cm} = 5.16 \text{ cm}$$

Some organisms can make their own light too? This ability is called bioluminescence. Worms, fish, squid, starfish and some other organisms that live in the dark sea habitat glow or flash light to scare off predators

Problem 4: The speed of light in air is $3 \times 10^8 \text{ ms}^{-1}$ and in glass it is $2 \times 10^8 \text{ ms}^{-1}$. What is the refractive index of glass?

Solution: ${}_a\mu_g = 3 \times 10^8 / 2 \times 10^8 = 3/2 = 1.5$

Problem 5: Light travels from a rarer medium to a denser medium. The angles of incidence and refraction are respectively 45° and 30° . Calculate the refractive index of the second medium with respect to the first medium.

Solution: ${}_1\mu_2 = \sin i / \sin r = \sin 45^\circ / \sin 30^\circ = 1/\sqrt{2} / 1/2 = \sqrt{2} = 1.414$

An Indian-born physicist Narinder Kapany is regarded as the Father of Fibre Optics.

Choose the best answers:

1. A ray of light passes from one medium to another medium. Refraction takes place when angle of incidence is

- (a) 0°
- (b) 45°
- (c) 90°

2. _____ is used as reflectors in torchlight.

- (a) Concave mirror
- (b) Plane mirror
- (c) Convex mirror

3. We can create enlarged, virtual images with

- (a) Concave mirror
- (b) Plane mirror
- (c) Convex mirror

4. When the reflecting surface is curved outwards the mirror formed will be

- (a) Concave mirror
- (b) Convex mirror
- (c) Plane mirror

5. When a beam of white light passes through a prism it gets

- (a) Reflected
- (b) Only deviated
- (c) Deviated and dispersed

6. The speed of light is maximum in

- (a) Vacuum
- (b) Glass

(c) Diamond

State true or false. If false, correct the statement:

1. The angle of deviation depends on the refractive index of the glass.
2. If a ray of light passes obliquely from one medium to another, it does not suffer any deviation.
3. The convex mirror always produces a virtual, diminished and erect image of the object.
4. When an object is at the centre of curvature of concave mirror the image formed will be virtual and erect.
5. The reason for brilliance of diamonds is total internal reflection of light.

Fill in the blanks:

1. In going from a rarer to denser medium, the ray of light bends _____.
2. The mirror used in search light is _____.
3. The angle of deviation of light ray in a prism depends on the angle of _____.
4. The radius of curvature of a concave mirror whose focal length is 5 cm is _____.
5. Large _____ mirrors are used to concentrate sunlight to produce heat in solar furnaces.

Match the following:

1. Ratio of height of image to height of object - concave mirror
2. Used in hairpin bends in mountains - total internal reflection
3. Coin inside water appearing slightly raised - magnification
4. Mirage - convex mirror
5. Used as Dentist's mirror - refraction

Consider the statements given below and choose the correct option:

- (a) If both assertion and reason are true and reason is the correct explanation of assertion
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion
- (c) If assertion is true but reason is false
- (d) If assertion is false but reason is true

1. Assertion: For observing the traffic at a hairpin bend in mountain paths a plane mirror is preferred over convex mirror and concave mirror.

Reason: A convex mirror has a much larger field of view than a plane mirror or a concave mirror.

2. Assertion: Incident ray is directed towards the centre of curvature of spherical mirror. After reflection it retraces its path.

Reason: Angle of incidence (i) = Angle of reflection (r) = 0°.

Answers:

Choose the best answers:

1. 45° 2. Concave mirror 3. Concave mirror 4. convex mirror 5. deviated and dispersed 6. vacuum

State true or false. If false, correct the statement:

1. True
2. False

Correct answer: When a light travel from one medium to another, it suffers dispersion

3. True
4. False

Correct answer: The image formed will be Real, inverted and same size of the object

5. True

Fill in the blanks:

1. Towards normal 2. Concave mirror 3. Prism and angle of incident 4. 10 Cm 5. Concave

Match the following:

1. Ratio of height of image to height of object - Magnification
2. Used in hairpin bends in mountains - Convex mirror
3. Coin inside water appearing slightly raised - Refraction
4. Mirage- Total internal reflection
5. Used as Dentist's mirror- Concave mirror

Consider the statements given below and choose the correct option:

1. If assertion is false but reason is true
2. If both assertion and reason are true and reason is not the correct explanation.

9th Science Lesson 7**7] Heat****Do You Know?**

When a dog keeps out its tongue and breathes hard, the moisture on the tongue turns into water and it evaporates. Since, heat energy is needed to turn a liquid into a gas, heat is removed from dog's tongue. This helps to cool the body of the dog.

While firing wood, we can observe all the three ways of heat transfer. Heat in one end of the wood will be transferred to other end due to conduction. The air near the wood will become warm and replace the air above. This is convection. Our hands will be warm because heat reaches us in the form of radiation.

Problem 1: Convert the following: (i) 25°C to Kelvin (ii) 200 K to °C

Solution: (i) $T_K = T_{oC} + 273.15 = 25 + 273.15 = 298.15 \text{ K}$

(ii) $T_{oC} = T_K - 273.15 = 200 - 273.15 = -73.15^\circ\text{C}$

Problem 2: Convert the following: (i) 35°C to Fahrenheit (°F) (ii) 14°F to °C

Solution: (i) $T_{oF} = T_{oC} \times 1.8 + 32 = 35^\circ\text{C} \times 1.8 + 32 = 95^\circ\text{F}$

(ii) $T_{oC} = (T_{oF} - 32) / 1.8 = (14^\circ\text{F} - 32) / 1.8 = -10^\circ\text{C}$

Problem 3: Calculate the heat energy required to raise the temperature of 2 kg of water from 10°C to 50°C. Specific heat capacity of water 4200 J Kg⁻¹ K⁻¹

Solution: Given m = 2 kg, $\Delta T = (50 - 10) = 40^\circ\text{C}$. In terms of Kelvin, $\Delta T = (323.15 - 283.15) = 40\text{K}$, C = 4200 J Kg⁻¹K⁻¹

\therefore Heat energy required, $Q = m \times C \times \Delta T = 2 \times 4200 \times 40 = 3,36,000 \text{ J}$.

Water in its various form, has different specific heat capacities. Water (Liquid state) = 4200 J Kg⁻¹ K⁻¹; Ice (Solid state) = 2100 J Kg⁻¹ K⁻¹; Steam (Gaseous state) = 460 J Kg⁻¹ K⁻¹

Problem 4: An iron ball requires 5000 J heat energy to raise its temperature by 20 K. Calculate the heat capacity of the iron ball.

Solution: Given, Q = 5000 J, $\Delta T = 20 \text{ K}$. Heat Capacity, C = Heat energy required, Q/Rise in temperature, $\Delta T = 5000/20 = 250 \text{ JK}^{-1}$

Problem 5: How much heat energy is required to melt 5 kg of ice? (Specific latent heat of ice = 336 Jg⁻¹)

Solution: Given, m = 5 Kg = 5000 g, L = 336 Jg⁻¹

Heat energy required = $m \times L = 5000 \times 336 = 1680000 \text{ J}$ or $1.68 \times 10^6 \text{ J}$

Problem 6: How much boiling water at 100°C is needed to melt 2 kg of ice so that the mixture which is all water is at 0°C?

[Specific heat capacity of water = 4.2 J Kg⁻¹ and Specific latent heat of ice = 336 Jg⁻¹].

Solution: Given, mass of ice = 2 kg = 2000 g. Let 'm' be the mass of boiling water required. Heat lost = Heat gained.

$$m \times c \times \Delta t = m \times L$$

$$m \times 4.2 \times (100 - 0) = 2000 \times 336$$

$$m = 2000 \times 336 / 4.2 \times 100 = 1600 \text{ g or } 1.6 \text{ kg.}$$

Choose the best answers:

1. Calorie is the unit of

- (a) Heat
- (b) Work
- (c) Temperature
- (d) Food

2. SI unit of temperature is

- (a) Fahrenheit
- (b) Joule
- (c) Celsius
- (d) Kelvin

3. Two cylindrical rods of same length have the area of cross section in the ratio 2:1. If both the rods are made up of same material, which of them conduct heat faster?

(a) Both rods

(b) Rod-2

(c) Rod-1

(d) None of them

4. In which mode of transfer of heat, molecules pass on heat energy to neighbouring molecules without actually moving from their positions?

(a) Radiation

(b) Conduction

(c) Convection

(d) Both B and C

5. A device in which the loss of heat due to conduction, convection and radiation is minimized is

(a) Solar cell

(b) Solar cooker

(c) Thermometer

(d) Thermos flask

Fill in the blanks:

1. The fastest mode of heat transfer is _____.

2. During day time, air blows from _____ to _____.

3. Liquids and gases are generally _____ conductors of heat.

4. The fixed temperature at which matter changes state from solid to liquid is called _____.

Consider the statements given below and choose the correct option:

(a) If both assertion and reason are true and reason is the correct explanation of assertion

(b) If both assertion and reason are true but reason is not the correct explanation of assertion

(c) If assertion is true but reason is false

(d) If assertion is false but reason is true

1. Assertion: Food can be cooked faster in vessels with copper bottom.

Reason: copper is the best conductor of heat.

2. Assertion: Maximum sunlight reaches earth's surface during the noon time.

Reason: Heat from the sun reaches earth's surface by radiation.

3. Assertion: When water is heated up to 100°C , there is no raise in temperature until all water gets converted into water vapour.

Reason: Boiling point of water is 10^0 C.

Answers:**Choose the best answers:**

1. Heat 2. Kelvin 3. Rod – 1 4. Conduction 5. thermos flask

Fill in the blanks:

1. Radiation 2. Land, sea 3. Bad 4. Melting point

Consider the statements given below and choose the correct option:

- 1.If both assertion and reason are true and reason is the correct explanation of assertion
- 2.If both assertion and reason are true but reason is not the correct explanation of assertion.
- 3.If assertion is true but reason is false.

9th Science Lesson 8**8] Sound****Do You Know?**

Problem 1: A sound wave has a frequency of 2 kHz and wavelength of 15 cm. How much time will it take to travel 1.5 km?

Solution: Speed, $v = n\lambda$

Here, $n = 2 \text{ kHz} = 2000 \text{ Hz}$

$\lambda = 15 \text{ cm} = 0.15 \text{ m}$

$v = 0.15 \times 2000 = 300 \text{ ms}^{-1}$

Time (t) = Distance (d) / Velocity (v)

$t = 1500/300 = 5\text{s}$

The sound will take 5 s to travel a distance of 1.5 km.

Problem 2: What is the wavelength of a sound wave in air at 20°C with a frequency of 22 MHz?

Solution: $\lambda = v/n$

Here, $v = 344 \text{ ms}^{-1}$

$n = 22 \text{ MHz} = 22 \times 10^6 \text{ Hz}$

$\lambda = 344/22 \times 10^6 = 15.64 \times 10^{-6} \text{ m} = 15.64 \mu\text{m}$.

Sonic boom: When the speed of any object exceeds the speed of sound in air (330 ms^{-1}) it is said to be travelling at supersonic speed. Bullets, jet, aircrafts etc., can travel at supersonic speeds. When an object travels at a speed higher than that of sound in air, it produces shock waves. These shock waves carry a large amount of energy. The air pressure variations associated with this type of shock waves produces a very sharp and loud sound

called the 'sonic boom'. The shock waves produced by an aircraft have energy to shatter glass and even damage buildings.

Sound travels about 5 times faster in water than in air. Since the speed of sound in sea water is very large (being about 1530 ms^{-1} which is more than 5500 km/h^{-1}), two whales in the sea which are even hundreds of kilometres away can talk to each other very easily through the sea water.

Use of ear phones for long hours can cause infection in the inner parts of the ears, apart from damage to the ear drum. Your safety is in danger if you wear ear phones while crossing signals, walking on the roads and travelling. Using earphones while sleeping is all the more dangerous as current is passing in the wires. It may even lead to mental irritation. Hence, you are advised to deter from using earphones as far as possible.

Problem 3: A man fires a gun and hears its echo after 5s. The man then moves 310 m towards the hill and fires his gun again. If he hears the echo after 3 s, calculate the speed of sound.

Solution: Distance (d) = velocity (v) x time (t)

Distance travelled by sound when gun fires first time, $2d = v \times 5$ (1)

Distance travelled by sound when gun fires second time, $2d - 620 = v \times 3$ (2)

Rewriting equation (2) as, $2d = (v \times 3) + 620$ (3)

Equating (1) and (3), $5v = 3v + 620$

$2v = 620$

Velocity of sound, $v = 310 \text{ ms}^{-1}$

Animals, such as bats, dolphins, rats, whales and oil birds, use echolocation, an ultrasound technique that uses echoes to identify and locate objects. Echolocation allows bats to navigate through dark caves and find insects for food. Dolphins and whales emit a rapid series of underwater clicks in ultrasonic frequencies to locate their prey and navigate through water.

Problem 4: A ship sends out ultrasound that returns from the seabed and is detected after 3.42 s. If the speed of ultrasound through sea water is 1531 ms^{-1} , what is the distance of the seabed from the ship?

Solution: We know, distance = speed x time

$2d = \text{speed of ultrasound} \times \text{time}$

$2d = 1531 \times 3.42$

$\therefore d = 5236/2 = 2618 \text{ m}$

Thus, the distance of the seabed from the ship is 2618 m or 2.618 km.

Choose the best answers:

1. Which of the following vibrates when a musical note is produced by the cymbals in an orchestra?

- (a) Stretched strings
- (b) Stretched membranes
- (c) Air columns
- (d) Metal plates

2. Sound travels in air:

- (a) If there is no moisture in the atmosphere
- (b) If particles of medium travel from one place to another
- (c) If both particles as well as disturbance move from one place to another
- (d) If disturbance moves

3. A musical instrument is producing continuous note. This note cannot be heard by a person having a normal hearing range. This note must then be passing through

- (a) Wax
- (b) Vacuum
- (c) Water
- (d) Empty vessel

4. The maximum speed of vibrations which produces audible sound will be in

- (a) Sea water
- (b) Ground glass
- (c) Dry air
- (d) Human blood

5. The sound waves travel faster

- (a) In liquids
- (b) In gases
- (c) In solids
- (d) In vacuum

Fill in the blanks:

1. Sound is a _____ wave and needs a material medium to travel.
2. Number of vibrations produced in one second is _____.
3. The velocity of sound in solid is _____ than the velocity of sound in air.
4. Vibration of object produces _____.
5. Loudness is proportional to the square of the _____.
6. _____ is a medical instrument used for listening to sounds produced in the body.
7. The repeated reflection that results in persistence of sound is called _____.

Match the following:

1. Tuning fork - the point where density of air is maximum

2. Sound - maximum displacement from the equilibrium position
3. Compressions - the sound whose frequency is greater than 20,000 Hz
4. Amplitude - longitudinal wave
5. Ultrasonics - production of sound

Answers:**Choose the best answers:**

1. stretched strings 2. if particles of medium travel from one place to another 3. empty vessel 4. sea water 5. in solids

Fill in the blanks:

1. Longitudinal 2. Frequency of wave 3. Faster 4. Sound 5. Amplitude 6. ECG or Stethoscope 7. Reverberation

Match the following:

1. Tuning fork - Production of sound
2. Sound- The point where density of air is maximum
3. Compressions- Longitudinal wave
4. Amplitude- Maximum displacement from the equilibrium position
5. Ultrasonics- The sound whose frequency is greater than 20,000 Hz

9th Science Lesson 9**9] Universe****Do You Know?**

The distance of Andromeda, our nearest galaxy is approximately 2.5 million light-years. If we move at the speed of the Earth (30 km/s), it would take us 25 billion years to reach it!

The Sun travelling at a speed of 250 km per second (9 lakh km/h) takes about 225 million years to complete one revolution around the Milky Way. This period is called a cosmic year.

Problem 1: Can you calculate the orbital velocity of a satellite orbiting at an altitude of 500 km? Data: $G = 6.673 \times 10^{-11}$ SI units; $M = 5.972 \times 10^{24}$ kg; $R = 6371000$ m; $h = 500000$ m.

Solution: $v = \sqrt{6.67 \times 10^{-11} \times 5.972 \times 10^{24} / (6371000 + 500000)}$

Ans: $v = 7613 \text{ ms}^{-1}$ or 7.613 kms^{-1}

Microgravity is the condition in which people or objects appear to be weightless. The effects of microgravity can be seen when astronauts and objects float in space. Micro – means very small, so microgravity refers to the condition where gravity ‘seems’ to be very small.

Problem 2: At an orbital height of 500 km, find the orbital period of the satellite.

Solution: $h = 500 \times 10^3 \text{ m}$, $R = 6371 \times 10^3 \text{ m}$, $v = 7616 \times 10^3 \text{ ms}^{-1}$.

$T = 2\pi(R + h) / v = 2 \times 22/7 \times (6371 + 500) / 7616 = 5.6677 \times 10^3 \text{ s} = 5667 \text{ s}$.

This is $T \approx 95 \text{ min}$

All stars appear to us as moving from east to west, where as there is one star which appears to us stationary in its position. It has been names as Pole star. The pole star appears to us as fixed in space at the same place in the sky in the north direction because it lies on the axis of rotation of the Earth which itself is fixed and does not change its position in space. It may be noted that the pole star is not visible from the southern hemisphere.

Choose the best answers:

1. Who proposed the heliocentric model of the universe?

- (a) Tycho Brahe
- (b) Nicolaus Copernicus
- (c) Ptolemy
- (d) Archimedes

2. Which of the following is not a part of outer solar system?

- (a) Mercury
- (b) Saturn
- (c) Uranus
- (d) Neptune

3. Ceres is a _____

- (a) Meteor
- (b) Star
- (c) Planet
- (d) Astroid

4. The period of revolution of planet A around the Sun is 8 times that of planet B. How many times is the distance of planet A as great as that of planet B?

- (a) 4
- (b) 5
- (c) 2
- (d) 3

5. The Big Bang occurred _____ year ago.

- (a) 13.7 billion
- (b) 15 million
- (c) 15 billion
- (d) 20 million

Fill in the blanks:

1. The speed of Sun in km/s is _____.
2. The rotational period of the Sun near its poles is _____.
3. India's first satellite is _____.
4. The third law of Kepler is also known as the Law of _____.
5. The number of planets in our Solar System is _____.

State true or false. If false, correct the statement:

1. ISS is a proof for international cooperation.
2. Halley's Comet appears after nearly 67 hours.
3. Satellites nearer to the Earth should have lesser orbital velocity.
4. Mars is called the red planet.

Answers:**Choose the best answers:**

1. Nicolaus Copernicus
2. Mercury
3. Asteroid
4. 2
5. 13.7 billion

Fill in the blanks:

1. 250
2. 36 days
3. Aryabhatta
4. Harmonies
5. 8

State true or false. If false, correct the statement:

1. True
2. False

Correct answer: Halley's comet appears after nearly 76 years

3. False

Correct answer: Nearer the object to the earth, the faster is the required orbital velocity

4. True

9th Science Lesson 10**10] Matter Around Us****Do You Know?**

Not all things that we see or feel are matter. For example, sunlight, sound, force and energy neither occupy space nor have any mass. They are not matter.

Atom: The smallest unit of an element which may or may not have an independent existence, but always takes part in a chemical reaction is called atom.

Molecules: The smallest unit of a pure substance, which always exists independently and can retain physical and chemical properties of that substances is called a molecule.

Examples: Hydrogen molecule consists of two hydrogen atoms (H_2). Water molecule consist of two hydrogen atoms (H_2) and one oxygen atom (O).

In the modern periodic table there are 118 elements known to us, 92 of which are naturally occurring while the remaining 26 have been artificially created. But from these 118 elements, crores of compounds are formed some naturally occurring and some artificial. Isn't that amazing?

LPG – Liquefied Petroleum Gas: It is highly inflammable hydrocarbon gas. It contains mixture of butane and propane gases. LPG, liquefied through pressurisation, is used for heating, cooking, auto fuel etc.

Compounds of phosphorous, nitrogen and potassium are used in fertilizers. Silicon compounds are of immense importance in the computer industry. Compounds of fluorine are used in our toothpastes as they strengthen our teeth.

Blood is not a pure substance. It is a mixture of various components such as platelets, red and white blood corpuscles and plasma.

The air freshners are used in toilets. The solid slowly sublimates and releases the pleasant smell in the toilet over a certain period of time. Moth ball, made of naphthalene are used to drive away moths and some other insects. These also sublime over time. Camphor, is a substance used in Indian household. It sublimates to give a pleasant smell and is sometimes used as a freshner.

Solvent extraction is an old practice done for years. It is the main process in perfume development and it is also used to obtain dyes from various sources.

The beam of light coming from headlights of vehicles is due to Tyndall effect. Blue colour of sky is also to Tyndall effect.

Have you seen colourful patches on a wet road? When oil drops in water on road, it floats over water and forms a colourful film. Find out why.

Choose the best answers:

1. The separation of denser particles from lighter particles done by rotation at high speed is called _____

- (a) Filtration
- (b) Sedimentation
- (c) Decantation
- (d) Centrifugation

2. Among the following _____ is a mixture.

- (a) Common salt
- (b) Juice
- (c) Carbon dioxide
- (d) Pure silver

3. When we mix drop of ink in water we get a _____

- (a) Heterogeneous mixture
- (b) Compound

(c) Homogeneous mixture

(d) Suspension

4. _____ is essential to perform separation by solvent extraction method.

(a) Separating funnel

(b) Filter paper

(c) Centrifuge machine

(d) Sieve

5. _____ has the same properties throughout the sample.

(a) Pure substance

(b) Mixture

(c) Colloid

(d) Suspension

State true or false. If false, correct the statement:

1. Oil and water are immiscible with each other.

2. A compound cannot be broken into simpler substances chemically.

3. Liquid – liquid colloids are called gel.

4. Buttermilk is an example of heterogeneous mixture.

5. Aspirin is composed of 60% Carbon, 4.5% Hydrogen and 35.5% Oxygen by mass. Aspirin is a mixture.

Match the following:

1. Element - settles down on standing

2. Compound - impure substance

3. Colloid - made up of molecules

4. Suspension - pure substance

5. Mixture - made up of atoms

Fill in the blanks:

1. A _____ mixture has no distinguishable boundary between its components.

2. An example of a substance that sublimates is _____.

3. Alcohol can be separated from water by _____.

4. In petroleum refining, the method of separation used is _____.

5. Chromatography is based on the principle of _____.

Answers:**Choose the best answers:**

1. centrifugation 2. Juice 3. Homogeneous Mixture 4. Separating funnel 5. Pure substance

State true or false. If false, correct the statement:

1. True

2. False

Correct answer: A compound can be broken into simpler substances chemically

3. False

Correct answer: Liquid – solid colloids are called gel.

4. True

5. False

Correct answer: The constituents of Aspirin are fixed ratio by mass. So it is a compound

Match the following:

1. Element- Made up of molecules

2. Compound- pure substance

3. Colloid- Settles down on standing

4. Suspension- Impure substance

5. Mixture- Made up of atoms

Fill in the blanks:

1. Homogenous 2. Naphthalene 3. Distillation 4. Fractional distillation

9th Science Lesson 11**11] Atomic Structure****Do You Know?**

In 1920 Rutherford predicted the presence of another particle in the nucleus as neutral. James Chadwick, the inventor of neutron was student of Rutherford.

Besides the fundamental particles like protons, electrons and neutrons some more particles are discovered in the nucleus of an atom. They include mesons, neutrino, antineutrino, positrons etc.

Atomic number is designated as Z why? Z stands for Zahl, which means NUMBER in German. Z can be called Atomzahl or atomic number. A is the symbol recommended in the ACS style guide instead of M (massenzahl in German).

Problem 1: Calculate the atomic number of an element whose mass number is 39 and number of neutrons is 20. Also find the name of the element.

Solution: Mass number = Atomic number + Number of neutrons

Atomic number = Mass number – number of neutrons = 39 – 20 = 19

Element having atomic number 19 is Potassium (K).

Atoms are so tiny their mass number cannot be expressed in amu (atomic mass unit). New unit is U. Size of an atom can be measured in nano metre ($1 \text{ nm} = 10^{-9} \text{ m}$) Even though atom is an invisible tiny particle now-a-days atoms can be viewed through SEM that is scanning electron microscope.

Problem 2: What is the electronic configuration of aluminium?

Solution: Electronic configuration of aluminium atom: ($Z=13$) K shell = 2, L shell = 8 and M shell = 3 electron. So its electronic configuration is 2, 8, 3.

The forces between the protons and the neutrons in the nucleus are of special kind called Yukawa forces. This strong force is more powerful than gravity.

Problem 3: Find the valency of Magnesium and Sulphur.

Solution: Electronic configuration of magnesium is 2, 8, 2. So, valency is 2. Electronic configuration of sulphur is 2, 8, 6. So valency is 2 i.e. (8-6).

Thumb rule for isotopes and isobars. Remember t for top and b for bottom. Isotope: Top value changes – atomic mass. Isobars: Bottom value changes – atomic number.

Choose the best answers:

1. Among the following the odd pair is

- (a) $^{18}_8\text{O}$, $^{19}_9\text{F}$
- (b) $^{40}_{18}\text{Ar}$, $^{14}_7\text{N}$
- (c) $^{30}_{14}\text{Si}$, $^{31}_{15}\text{P}$
- (d) $^{40}_{20}\text{Cr}$, $^{39}_{19}\text{K}$

2. Change in the number of neutrons in an atom changes it to

- (a) An ion
- (b) an isotope
- (c) an isobar
- (d) another element

3. The term nucleons refer to

- (a) Protons and electrons
- (b) Only neutrons
- (c) Electrons and neutrons
- (d) Protons and neutrons

4. The number of protons, neutrons and electrons present respectively in $^{80}_{35}\text{Br}$ are

- (a) 80, 80, 35
- (b) 35, 55, 80

(c) 35, 35, 80

(d) 35, 45, 35

5. The correct electronic configuration of potassium is

(a) 2, 8, 9

(b) 2, 8, 1

(c) 2, 8, 8, 1

(d) 2, 8, 8, 3

State true or false. If false, correct the statement:

1. In an atom, electrons revolve around the nucleus in fixed orbits.

2. Isotopes of an element have different atomic numbers.

3. Electrons have negligible mass and charge.

4. Smaller the size of the orbit, lower is the energy of the orbit.

5. The maximum number of electron in L shell is 10.

Fill in the blanks:

1. Calcium and Argon are examples of a pair of _____.

2. Total number of electrons that can be accommodated in an orbit is given by _____.

3. _____ isotope is used in the nuclear reactors.

4. The number of neutrons present in ${}^7_3\text{Li}$ is _____.

5. The valency of Argon is _____.

Match the following:

1. Dalton - hydrogen atom model

2. Chadwick - discovery of nucleus

3. Rutherford - first atomic theory

4. Neils Bohr - plum pudding model

- discovery of neutrons

Answers:**Choose the best answers:**1. ${}^{40}_{18}\text{Ar}$, ${}^{14}_7\text{N}$ 2. an isotope 3. protons and neutrons 4. 35, 45, 35 5. 2,8,8,1**State true or false. If false, correct the statement:**

1. True

2.False

Correct answer: Isotopes are atoms of same elements with atomic numbers

3.False

Correct answer: Electrons have negligible mass and have negative charge

4.True

5.False

Correct answer: The maximum number of electron in L Shell is 8

Fill in the blanks:

1. Isobars 2. $2n^2$ 3. Radio 4. 4 5. 0

Match the following:

1.Dalton- First atomic theory

2.Chadwick- Discovery of neutrons

3.Rutherford- Discovery of nucleus

4.Neils Bohr- Hydrogen atom model

9th Science Lesson 12

12] Periodic Classification Of Elements

Choose the best answers:

1. If Dobereiner is related with 'law of triads', then Newlands is related with

(a) Modern periodic law

(b) Hund's rule

(c) Law of octaves

(d) Pauli's exclusion principle

2. Modern periodic law states that the physical and chemical properties of elements are the periodic functions of their _____

(a) Atomic numbers

(b) Atomic masses

(c) Similarities

(d) Anomalies

3. Elements in the modern periodic table are arranged in _____ groups and _____ periods.

(a) 7, 18

(b) 18, 7

(c) 17, 8

(d) 8, 17

Fill in the blanks:

1. In Dobereiner's triads, the atomic weight of the middle elements is the _____ of the atomic masses of 1st and 3rd elements.
2. Noble gases belong to _____ group of the periodic table.
3. The basis of the classifications proposed by Dobereiner, Newlands and Mendeleev was _____.
4. Example for liquid metal is _____.

Match the following:

1. Triads - Newlands
2. Alkali metal - Calcium
3. Law of octaves - Henry Moseley
4. Alkaline earth metal - Sodium
5. Modern Periodic Law - Dobereiner

State true or false. If false, correct the statement:

1. Newland's periodic table is based on atomic masses of elements and modern periodic table is based on atomic number of elements.
2. Metals can give electrons.
3. Alloys bear the characteristics of both metals and non-metals.
4. Lanthanides and actinides are kept at the bottom of the periodic table because they resemble each other but they do not resemble with any other group elements.
5. Group 17 elements are named as Halogens.

Consider the statements given below and choose the correct option:

Statement: Elements in a group generally possess similar properties but elements along a period have different properties.

Reason: The difference in electronic configuration makes the element differ in their chemical properties along a period.

- (a) Statement is true and reason explains the statement.
- (b) Statement is false but the reason is correct.

Answers:**Choose the best answers:**

1. Law of octaves 2. atomic numbers 3. 18, 7

Fill in the blanks:

1. Average 2. 18th 3. Atomic masses 4. Mercury

Match the following:

1. Triads- Dobereiner
2. Alkali metal- Sodium
3. Law of octaves- Newlands
4. Alkaline earth metal- Calcium
5. Modern Periodic Law- Henry Moseley

State true or false. If false, correct the statement:

1. True
2. False
Correct answer: Metals tend to lose electrons to attain noble electron configuration
3. False
Correct answer: An alloy is a mixture of both metals
4. True
5. True

Consider the statements given below and choose the correct option:

1. Statement is true and reason explains the statement

9th Science Lesson 13**13] Chemical Bonding****Do You Know?**

The number of electrons lost from a metal atom is the valency of the metal and the number of electrons gained by a non-metal is the valency of the non-metal.

Note that dots are placed one to each side of the letter symbol until all four sides are occupied. Then the dots are written two to a side until all valence electrons are accounted for. The exact placement of the single dots is immaterial.

The number of electrons that an atom of an element loses or gains to form an electrovalent bond is called its Electrovalency.

Covalent bonds are of three types:

1. Single covalent bond represented by a line (-) between the two atoms. Eg. $H - H$
2. Double covalent bond represented by a double line (=) between the two atoms. Eg. $O = O$
3. Triple covalent bond represented by a triple line (\equiv) between the two atoms. Eg. $N \equiv N$

Polar solvents contain bonds between atoms with very different electro-negatives, such as oxygen and hydrogen. Ionic compounds are soluble in polar solvents. Ex: water, ethanol, acetic acid, ammonia.

Non polar solvents contain bonds between atoms with similar electro negativities, such as carbon and hydrogen. Covalent compounds are soluble in non-polar solvents. Ex: acetone, benzene, toluene, turpentine.

Electro-negativity is the tendency of an atom in a molecule to attract towards itself the shared pair of electrons.

Choose the best answers:

1. Number of valence electrons in carbon is

- (a) 2
- (b) 4
- (c) 3
- (d) 5

2. Sodium having atomic number 11, is ready to _____ electron/electrons to attain the nearest noble gas electronic configuration.

- (a) Gain one
- (b) Gain two
- (c) Lose one
- (d) Lose two

3. The element that would form anion by gaining electrons in a chemical reaction is _____

- (a) Potassium
- (b) Calcium
- (c) Fluorine
- (d) Iron

4. Bond formed between a metal and non-metal atom is usually _____

- (a) Ionic bond
- (b) Covalent bond
- (c) Coordinate bond

5. _____ compounds have high melting and boiling points.

- (a) Covalent
- (b) Coordinate
- (c) Ionic

6. Covalent bond is formed by _____

- (a) Transfer of electrons
- (b) Sharing of electrons
- (c) Sharing a pair of electrons

7. Oxidising agents are also called as _____ because they remove electrons from other substance.

- (a) Electron donors
- (b) Electron acceptors

8. Elements with stable electronic configurations have eight electrons in their valence shell. They are -----

- (a) Halogens
- (b) Metals
- (c) Noble gases
- (d) Non metals

9. The property which is characteristics of an Ionic compound is that

- (a) It often exists as gas at room temperature
- (b) It is hard and brittle
- (c) It undergoes molecular reaction
- (d) It has low melting point

10. Identify the following reactions as oxidation or reduction

- (a) $\text{Na} \rightarrow \text{Na}^+ + \text{e}^-$
- (b) $\text{Fe}^{3+} + 2 \text{e}^- \rightarrow \text{Fe}^+$

11. Identify the compounds as Ionic/Covalent/Coordinate based on the given characteristics:

- (a) Soluble in non polar solvents
- (b) Undergoes faster/instantaneous reactions
- (c) Non conductors of electricity
- (d) Solids at room temperature

Answers:

Choose the best answers:

1. 4 2. Lose one 3. Fluorine 4. Ionic bond 5. ionic 6. sharing of electrons
7. electron acceptors 8. noble gases 9. it is hard and brittle. 10. $\text{Na} \rightarrow \text{Na}^+ + \text{e}^-$
11. a) Covalent compounds b) Ionic compounds c) Covalent compounds d) Ionic compounds

9th Science Lesson 14

14] Acids, Bases And Salts

Do You Know?

All acids essentially contain one or more hydrogens. But all the hydrogen containing substances are not acids. For example, methane (CH_4) and ammonia (NH_3) also contain hydrogen. But they do not produce H^+ ions in aqueous solution.

For acids, we use the term basicity that refers to the number of replaceable hydrogen atoms present in one molecule of an acid. For example, acetic acid (CH_3COOH) has four hydrogen atoms but only one can be replaced. Hence it is monobasic.

Ionisation is the condition of being dissociated into ions by heat or radiation or chemical reactions or electrical discharge.

Caution: Care must be taken while mixing any concentrated inorganic acid with water. The acid must be added slowly and carefully with constant stirring to water since it generates large amount of heat. If water is added to acid, the mixture splashes out of the container and it may cause burns.

Few metals do not react with acid and liberate hydrogen gas. For example: Ag, Cu.

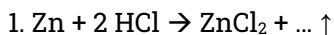
Role of water in acid solution: Acids show their properties only when dissolved in water. In water, they ionise to form H^+ ions which determine the properties of acids. They do not ionise in organic solvents. For example, when HCl is dissolved in water it produces H^+ ions and Cl^- ions whereas in organic solvents like ethanol they do not ionise and remain as molecule.

All alkalis are bases but not all bases are alkalis. For example: NaOH and KOH are alkalis whereas $\text{Al}(\text{OH})_3$ and $\text{Zn}(\text{OH})_2$ are bases.

Few metals do not react with sodium hydroxide. Example: Cu, Ag, Cr.

The term acidity is used for base, which means the number of replaceable hydroxyl groups present in one molecule of a base.

Choose the best answers:



- a) H_2
- b) O_2
- c) CO_2

2. Apple contains malic acid. Orange contains _____

- a) Citric acid
- b) ascorbic acid

3. Acids in plants and animals are organic acids. Whereas acids in rocks and minerals are _____

- a) Inorganic acids
- b) weak acids

4. Acids turn blue litmus paper to _____

- a) green
- b) red
- c) orange

5. Since metal carbonate and metal bicarbonate are basic, they react with acids to give salt and water with the liberation of _____ a) NO_2

b) SO₂

c) CO₂

6. The hydrate salt of copper sulphate has _____ colour

a) red

b) white

c) blue

Answers:

Choose the best answers:

1. H₂ 2. ascorbic acid 3. Inorganic acids 4. red 5. CO₂ 6. Blue

9th Science Lesson 15

15] Carbon And Its Compounds

Do You Know?

Graphene is most recently produced allotrope of carbon which consists of honeycomb shaped hexagonal ring repeatedly arranged in a plane. Graphene is the thinnest compound known to man at one atom thick. It is the lightest material known (with 1 square metre weighing around 0.77 milligrams) and the strongest compound discovered (100 – 300 times stronger than steel). It is a best conductor of heat at room temperature. Layers of graphene are stacked on top of each other to form graphite, with an inter planar spacing of 0.335 nanometers. The separate layers of graphene in graphite are held together by Vander Waals forces.

Choose the best answers:

1. A phenomenon in which an element exists in different modification in same physical state is called

(a) Isomerism

(b) Allotropy

(c) Catenation

(d) Crystallinity

2. Carbon forms large number of organic compounds due to

(a) Allotropy

(b) Isomerism

(c) Tetravalency

(d) Catenation

3. Nandhini brings his lunch every day to school in a plastic container which has resin code number 5. The container is made of

(a) Polystyrene

(b) PVC

(c) Polypropylene

(d) LDPE

4. Plastics made of Polycarbonate (PC) and Acrylonitrile Butadiene Styrene (ABS) are made of resin code _____

(a) 2

(b) 5

(c) 6

(d) 7

5. Graphene is one atom thick layer of carbon obtained from

(a) Diamond

(b) Fullerene

(c) Graphite

(d) Gas carbon

6. The legal measures to prevent plastic pollution come under the _____ Protection Act 1988.

(a) Forest

(b) Wildlife

(c) Environment

(d) Human rights

Fill in the blanks:

1. _____ names carbon.

2. Buckminster Fullerene contains _____ carbon atoms.

3. Compounds with same molecular formula and different structural formula are known as _____.

4. _____ is a suitable solvent for sulphur.

5. There are _____ plastic resin codes.

Match the following:

1. Alkyne - Bucky Ball

2. Andre Geim - Oxidation

3. C₆₀ - Graphene

4. Thermocol - Triple bond

5. Combustion - Polystyrene

Answers:**Choose the best answers:**

1. allotropy 2. Tetravalency 3. Polypropylene 4. 7 5. Graphite 6. Environment

Fill in the blanks:

1. Antoine Lavoisier 2. 60 3. Isomers 4. Carbon disulphide 5. 7

Match the following:

1. Alkyne- Triple bond
2. Andre Geim- Graphene
3. C₆₀ - Bucky Ball
4. Thermocol- Polystyrene
5. Combustion – Oxidation

9th Science Lesson 16**16] Applied Chemistry****Do You Know?**

Uranium in the ground can decay into radon gas which can be dangerous to humans. It is thought to be the second leading isotope to cause lung cancer.

40% of today's global population works in agriculture, making it the single largest employment in the world.

Choose the best answers:

1. One Nanometre is

- (a) 10⁻⁷ metre
- (b) 10⁻⁸ metre
- (c) 10⁻⁶ metre
- (d) 10⁻⁹ metre

2. The antibiotic Pencillin is obtained from _____

- (a) Plant
- (b) Microorganism
- (c) Animal
- (d) Sunlight

3. 1% solution of Iodoform is used as

- (a) Antipyretic
- (b) Antimalarial

(c) Antiseptic

(d) Antacid

4. The cathode of an electrochemical reaction involves _____

(a) Oxidation

(b) Reduction

(c) Neutralisation

(d) Catenation

5. The age of dead animal can be determined by using an isotope of _____

(a) Carbon

(b) Iodine

(c) Phosphorous

(d) Oxygen

6. Which of the following does not contain natural dyes?

(a) Potato

(b) Beetroot

(c) Carrot

(d) Turmeric

7. This type of food protect us from deficiency diseases.

(a) Carbohydrates

(b) Vitamins

(c) Proteins

(d) Fats

8. Radio chemistry deals with

(a) Oxidants

(b) Batteries

(c) Isotopes

(d) Nano-particles

9. The group responsible for the colour of an organic compound is called

(a) Isotopes

(b) Auxochrome

(c) Chromogen

(d) Chromophore

10. Chlorinated hydrocarbons are used as

(a) Fertilizers

(b) Pesticides

(c) Food colourants

(d) preservatives

Fill in the blanks:

1. _____ is an electrochemical cell which converts electrical energy into chemical change (reaction).

2. Painkiller drugs are called _____

3. Indigo is a _____ dye.

4. _____, _____ and _____ are macronutrients required for plant growth.

5. _____ is a chemical used in finger print analysis.

Match the following:

1. Antipyretics - large surface area

2. Corrosion prevention - Iodine – 131

3. Hyperthyroidism - fever

4. Nanoparticle - body building

5. Proteins – electroplating

Answers:

Choose the best answers:

1. 10^{-9} metre 2. Microorganism 3. Antiseptic 4. Reduction 5. Carbon 6. Potato 7. Vitamins 8. isotopes 9. Chromophore 10. Pesticides

Fill in the blanks:

1. Electrolytic cell 2. Analgesic 3. Analgesics 4. Nitrogen, Phosphorous, Potassium 5. Ninhydrin

Match the following:

1. Antipyretics - Fever

2. Corrosion prevention – Electroplating

3. Hyperthyroidism - Iodine- 131

4. Nanoparticle- large surface area

5. Proteins- Cancer cell identification

9th Science Lesson 17

17] Animal Kingdom

Do You Know?

Notochord is a rod like structure formed on the mid-dorsal side of the body during embryonic development. Except primitive forms in which the notochord persists throughout life in all other animals it is replaced by a backbone.

Centipede means 'hundred legs'. But most species have only 30 pairs. Millipedes have two pairs of legs on each segment. This name means 'thousand legs'. But, most millipedes have only about a hundred.

Octopus is the only invertebrate that is capable of emotion, empathy, cognitive function, self awareness, personality and even relationships with humans. Some speculate that without humans, octopus would eventually take our place as the dominate life form on earth.

The smallest vertebrate, Philippine goby/dwarf pygmy goby is a tropical species fish found in brackish water and mangrove areas in south East Asia, measuring only 10 mm in length.

The Chinese giant salamander *Andrias davidians* is the largest amphibian in the world. Its length is about five feet and eleven inches. Its weighs about 65 kg, found in Central and South China.

State bird of Tamil Nadu: Common Emerald dove (*Chalcophaps indica*).

The gigantic Blue whale which is 35 metres long and 120 tons in weight is the biggest vertebrate animal.

Choose the best answers:

1. Find the group having only marine members.

- (a) Mollusca
- (b) Coelenterata
- (c) Echinodermata
- (d) Porifera

2. Mesoglea is present in

- (a) Porifera
- (b) Coelenterata
- (c) Annelida
- (d) Arthropoda

3. Which one of the following pairs is not a poikilothermic animal?

- (a) Fishes and Amphibians
- (b) Amphibians and Aves
- (c) Aves and Mammals
- (d) Reptiles and Mammals

4. Identify the animal having four chambered heart.

- (a) Lizard
- (b) Snake
- (c) Crocodile
- (d) Calotes

5. The animal without skull is

- (a) Acrania
- (b) Acephalia
- (c) Apteris
- (d) Acoelomate

6. Hermaphrodite organisms are

- (a) Hydra, Tape worm, Earthworm, Amphioxus
- (b) Hydra, Tape Worm, Earth worm, Ascidian
- (c) Hydra, Tape worm, Earth worm, Balanoglossus
- (d) Hydra, Tape worm, Ascaris, Earth worm

7. Poikilothermic organisms are

- (a) Fish, Frog, Lizard, Man
- (b) Fish, Frog, Lizard, Cow
- (c) Fish, Frog, Lizard, Snake
- (d) Fish, Frog, Lizard, Crow

8. Air sacs and Pneumatic bones are seen in

- (a) Fish (b) Frog (c) Bird (d) Bat

9. Excretory organ of tape worm is

- (a) Flame cells
- (b) Nephridia
- (c) Body surface
- (d) Solenocytes

10. Water vascular system is found in

- (a) Hydra
- (b) Earth worm

(c) Star fish

(d) Ascaris

Fill in the blanks:

1. The skeletal framework of Porifera is _____.
2. Ctenidia are respiratory organs in _____.
3. Skates are _____ fishes.
4. The larvae of an amphibian is _____.
5. _____ are jawless vertebrates.
6. _____ is the unique characteristic feature of mammal.
7. Spiny anteater is an example for _____ mammal.

State true or false. If false, correct the statement:

1. Canal system is seen in coelenterates.
2. Hermaphrodite animals have both male and female sex organs.
3. Trachea are the respiratory organ of Annelida.
4. Bipinnaria is the larva of Mollusca.
5. Balanoglossus is a ciliary feeder.
6. Fishes have two chambered heart.
7. Skin of reptilians are smooth and moist.
8. Wings of birds are the modified forelimbs.
9. Female mammals have mammary glands.

Match the following:

PHYLUM EXAMPLES

1. Coelenterata - Snail
2. Platyhelminthes - Starfish
3. Echinodermata - Tapeworm
4. Mollusca - Hydra

Choose the best answers:

1. Echinodermata 2. Coelenterata 3. Fishes and Amphibians 4. Crocodile 5. Acrania 6. Hydra, Tape worm, Ascaris, Earthworm
7. Fish, Frog, Lizard, Snake 8. Bird 9. flame cells 10. Star fish

Fill in the blanks:

1. Spicules 2. Octopus 3. Cartilaginous 4. Tadpole 5. Cyclostomes 6. Placenta 7. Egg laying

State true or false. If false, correct the statement:

1.False

Correct answer: Canal system is seen in Porifera

2.True

3.False

Correct answer: Trachea are the respiratory organ of Arthropoda

4.False

Correct answer: Bipinnaria is the larva of Echinodermata

5.True

6.True

7.False

Correct answer: Skin of reptilians are horny epidermal scales

8.True

9.True

Match the following:

1.Coelenterata- Hydra

2.Platyhelminthes- Tapeworm

3.Echinodermata- starfish

4.Mollusca- Snail

9th Science Lesson 18

18| Organization Of Tissues

Do You Know?

In potato, parenchyma vacuoles are filled with starch. In apple, parenchyma stores sugar.

Epithelial tissue in the skin functions as a water-proof membrane.

Sprain is caused by excessive pulling (stretching) of ligaments.

Nerve cells do not undergo cell division due to the absence of centrioles, but they are developed from glial cells by neurogenesis.

Age of our body cells: Cells of the eye lens, nerve cells of cerebral cortex and most muscle cells last a life time but once dead are not replaced. Epithelial cells lining the gut last only about 5 days.

Duration of cell replacement:

Skin cells – about every 2 weeks

Bone cells – about every 10 years

Liver cells – about every 300 – 500 days

Red blood cells last for about 120 days and are replaced.

Choose the best answers:

1. The tissue composed of living thin walled polyhedral cell is

- (a) Parenchyma
- (b) Pollenchyma
- (c) Pclerenchyma
- (d) None of above

2. The fibres consists of

- (a) Parenchyma
- (b) Sclerenchyma
- (c) Collenchyma
- (d) None of above

3. Companion cells are closely associated with

- (a) Sieve elements
- (b) Vessel elements
- (c) Trichomes
- (d) Guard cells

4. Which of the following is a complex tissue?

- (a) Parenchyma
- (b) Collenchyma
- (c) Xylem
- (d) Sclerenchyma

5. Aerenchyma is found in

- (a) Epiphytes
- (b) Hydrophytes
- (c) Halophytes
- (d) Xerophytes

6. Smooth muscles occur in

- (a) Uterus
- (b) Artery
- (c) Vein
- (d) All of the above

7. Nerve cell does not contain

- (a) Axon
- (b) Nerve endings
- (c) Tendons
- (d) Dendrites

Match the following:

- 1. Sclereids - chlorenchyma
- 2. Chloroplast - sclerenchyma
- 3. Simple tissue - collenchymas
- 4. Companion cell - xylem
- 5. Trachieds - phloem

Fill in the blanks:

- 1. _____ tissues provide mechanical support to organs.
- 2. Parenchyma, collenchymas, Sclerenchyma are _____ type of tissues.
- 3. _____ and _____ are complex tissues.
- 4. Epithelial cells with cilia are found in _____ of our body.
- 5. Lining of small intestine is made up of _____.

State true or false. If false, correct the statement:

- 1. Epithelial tissue is protective tissue in animal body.
- 2. Bone and cartilage are two types of areolar connective tissues.
- 3. Parenchyma is a simple tissue.
- 4. Phloem is made up of tracheids.
- 5. Vessels are found in collenchymas.

Answers:

Choose the best answers:

1. Parenchyma 2. Sclerenchyma 3. Sieve elements 4. Xylem 5. Hydrophytes 6. Uterus 7. Tendons

Match the following:

- 1. Sclereids- Sclerenchyma
- 2. Chloroplast- Chlorenchyma
- 3. Simple tissue- Collenchyma
- 4. Companion cell- Phloem
- 5. Trachieds- xylem

Fill in the blanks:

1. Permanent 2. Simple 3. Xylem, Phloem 4. Trachea of wind pipe 5. Columnar epithelium

State true or false. If false, correct the statement:

1. True

2. False

Correct answer: Bone and cartilage are two types of supportive connective tissues

3. True

4. False

Correct answer: Phloem is a complex tissue: Sieve elements and companion cells

5. False

Correct answer: Vessels are found in xylem

9th Science Lesson 19**19] Plant Physiology****Do You Know?**

Some halophytes produce negatively geotropic roots (eg. Rhizophora). These roots turn 180° upright for respiration.

The Venus Flytrap (*Dionaea muscipula*) presents a spectacular example of thigmonasty. It exhibits one of the fastest known nastic movements.

Do the insects also trap solar energy? Tel Aviv University Scientists have found out that *Vespa orientalis* (Oriental Hornets) have similar capabilities to trap solar energy. They have a yellow patch on its abdomen and an unusual cuticle structure which is a stack of 30 layers thick. The cuticle does not contain chlorophyll but it contains the yellow light sensitive pigment called xanthopterin. This works as a light harvesting molecule transforming light energy into electrical energy.

Choose the best answers:

1. The tropic movement that helps the climbing vines to find a suitable support is _____

(a) Phototropism

(b) Geotropism

(c) Thigmotropism

(d) Chemotropism

2. The chemical reaction occurs during photosynthesis is _____

(a) CO₂ is reduced and water is oxidized

(b) Water is reduced and CO₂ is oxidized

(c) Both CO₂ and water are oxidized

(d) Both CO₂ and water are produced

3. The bending of root of a plant in response to water is called _____

(a) Thigmonsaty

(b) Phototropism

(c) Hydrotropism

(d) Photonasty

4. A growing seedling is kept in the dark room. A burning candle is placed near it for a few days. The tip part of the seedling bends towards the burning candle. This is an example of _____

(a) Chemotropism

(b) Geotropism

(c) Phototropism

(d) Thigmotropism

5. The root of the plant is _____

i) Positively phototropic but negatively geotropic

ii) Positively geotropic but negatively phototropic

iii) Negatively phototropic but positively hydrotropic

iv) Negatively hydrotropic but positively phototropic

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (iii) and (iv)

(d) (i) and (iv)

6. The non-directional movement of a plant part in response to temperature is called _____

(a) Thermotropism

(b) Thermonasty

(c) Chemotropism

(d) Thigmonasty

7. Chlorophyll in a leaf is required for _____

(a) Photosynthesis

(b) Tropic movement

(c) Transpiration

(d) Nastic movement

8. Transpiration takes place through _____

(a) Fruit

(b) Seed

(c) Flower

(d) Stomata

Fill in the blanks:

1. The shoot system grows upward in response to _____.
2. _____ is positively hydrotropic as well as positively geotropic.
3. The green pigment present in the plant is _____.
4. The solar tracking of sunflower in accordance with the path of sun is due to _____.
5. The response of a plant part towards gravity is _____.
6. Plants take in carbon-dioxide for photosynthesis but need _____ for their living.

Match column A with column B:

Column A Column B

1. Roots growing downwards into soil - Positive phototropism
2. Shoots growing towards the light - Negative geotropism
3. Shoots growing upward - Negative phototropism
4. Roots growing downwards away from light - Positive geotropism

State true or false. If false, correct the statement:

1. The response of a part of plant to the chemical stimulus is called phototropism.
2. Shoot is positively phototropic and negatively geotropic.
3. When the weather is hot, water evaporates lesser which is due to opening of stomata.
4. Photosynthesis produces glucose and carbon dioxide.
5. Photosynthesis is important in releasing oxygen to keep the atmosphere in balance.
6. Plants lose water when the stomata on leaves are closed.

Choose the best answers:

1. Thigmotropism 2. CO₂ is reduced and water is oxidized 3. Hydrotropism 4. Phototropism 5. (ii) and (iii) 6. Themonasty
7. Photosynthesis 8. Stomata

Fill in the blanks:

1. Negative geotropism 2. Root 3. Chlorophyll 4. Auxin(phototropism) 5. Geotropism 6. oxygen

Match column A with column B:

1. Roots growing downwards into soil - Positive geotropism

2. Shoots growing towards the light- Positive phototropism
3. Shoots growing upward- Negative geotropism
4. Roots growing downwards away from light- Negative phototropism

State true or false. If false, correct the statement:

1. False

Correct answer: The response of a part of plant to the chemical stimulus is called chemotropism

2. True

3. False

Correct answer: When the weather is hot, water evaporates faster which is due to opening of stomata.

4. False

Correct answer: Photosynthesis produces glucose and oxygen

5. True

6. False

Correct answer: Plants lose water when the stomata on leaves are open

9th Science Lesson 20**20] Organ Systems In Animals****Do You Know?**

Rennin: Causes curdling of milk protein casein and increases digestion of proteins.

Renin: Converts angiotensinogen to angiotensin and regulate the absorption of water and Na^+ from glomerular filtrate.

William Beaumont (1785 – 1853): William Beaumont was a surgeon who was known as the 'Father of Gastric Physiology'. Based on his observations he concluded that the stomach's strong hydrochloric acid played a key role in digestion.

The small intestine is about 5 m long and is the longest part of the digestive system. The large intestine is a thicker tube, but is about 1.5 m long.

Two healthy kidneys contain a total of about 2 million nephrons, which filter about 170 – 180 litres of blood per day. The kidneys reabsorb and redistribute 99% of the blood volume and only 1% of the blood filtered becomes urine.

First kidney transplant: In 1954, Joseph E. Murray and his colleagues at Peter Bent Brigham Hospital in Boston, USA performed first successful kidney transplant between Ronald and Richard Herrick who were identical twins. The recipient Richard Herrick died after 8 years of transplantation.

The sperm is the smallest cell in the male body. A normal male produces more than 500 billion sperm cells in his life time. The process of formation of sperms is known as spermatogenesis.

An ovum is the largest human cell. The process of formation of ova is known as oogenesis.

Choose the best answers:

1. Which of the following is not a salivary gland?

(a) Sublingual

(b) Lachrymal

(c) Submaxillary

(d) Parotid

2. Stomach of human beings mainly digests _____

(a) Carbohydrates

(b) Proteins

(c) Fat

(d) Sucrose

3. To prevent the entry of food into the trachea, the opening is guarded by _____

(a) Epiglottis

(b) Glottis

(c) Hard palate

(d) Soft palate

4. Bile helps in the digestion of _____

(a) Proteins

(b) Sugar

(c) Fats

(d) Carbohydrates

5. The structural and functional unit of the kidney is _____

(a) Villi

(b) Liver

(c) Nephron

(d) Ureter

6. Which of the following substance is not a constituent of sweater?

(a) Urea

(b) Protein

(c) Water

(d) Salt

7. The common passage meant for transporting urine and sperms in male is _____

(a) Ureter

(b) Urethra

(c) Vas deferens

(d) Scrotum

8. Which of the following is not a part of female reproductive system?

(a) Ovary

(b) Uterus

(c) Testes

(d) Fallopian tube

Fill in the blanks:

1. The opening of the stomach into the intestine is called _____.

2. The muscular and sensory organ which helps in mixing the food with saliva is _____.

3. Bile, secreted by liver is stored temporarily in _____.

4. The longest part of alimentary canal is _____.

5. The human body functions normally at a temperature of about _____.

6. The largest cell in the human body of a female is _____.

State true or false. If false, correct the statement:

1. Nitric acid in the stomach kills microorganisms in the food.

2. During digestion, proteins are broken down into amino acids.

3. Glomerular filtrate consists of many substances like amino acids, vitamins, hormones, salts, glucose and other essential substances.

Match the following:

Organ Elimination

1. Skin - Urine

2. Lungs - Sweat

3. Intestine - Carbon dioxide

4. Kidneys - Undigested food

Consider the statements given below and choose the correct option:

Mark the correct answer as:

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.

(d) If both Assertion and Reason are false.

1. Assertion: Urea is excreted out through the kidneys.

Reason: Urea is a toxic substance.

2. Assertion: In both the sexes gonads perform dual function.

Reason: Gonads are also called primary sex organ.

Answers:

Choose the best answers:

1. Lachrymal 2. Proteins 3. Epiglottis 4. Fats 5. Nephron 6. Protein 7. Urethra 8. Testes

Fill in the blanks:

1. Duodenum 2. Tongue 3. Gall bladder 4. Small intestine 5. 37°C 6. Ovum

State true or false. If false, correct the statement:

1.False

Correct answer: HCl in the stomach kills microorganisms in the food.

2.True

3.True

Match the following:

1.Skin- Sweat

2.Lungs- Carbon dioxide

3.Intestine- Undigested food

4.Kidneys- Urine

Consider the statements given below and choose the correct option:

1. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

2. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

9th Science Lesson 21

21] Nutrition And Health

Do You Know?

Human skin can synthesize Vitamin D when exposed to sunlight (especially early morning). When the sun rays falls on the skin dehydrocholesterol is converted into Vitamin D. Hence, Vitamin D is called as Sunshine vitamin. Vitamin D improves bone strength by helping body to absorb calcium.

Dr. Funk introduced the term vitamin. Vitamin A was given the first letter of the alphabet, as it was the first vitamin discovered.

Bananas are best stored at room temperature. When it is kept in a refrigerator, the enzyme responsible for ripening becomes inactive. In addition, the enzyme responsible for browning and cell damage becomes more active thereby causing the skin colour change from yellow to dark brown.

October 16th is World Food Day. It emphasizes on food safety and avoiding food wastage.

A slogan from farm to plate, make food safe was raised on World Health Day (7th April 2018) to promote and improve food safety.

Choose the best answers:

1. The nutrient required in trace amounts to accomplish various body functions is _____
 - (a) Carbohydrate
 - (b) Protein
 - (c) Vitamin
 - (d) Fat
2. The physician who discovered that scurvy can be cured by ingestion of citrus fruits is _____
 - (a) James Lind
 - (b) Louis Pasteur
 - (c) Charles Darwin
 - (d) Isaac Newton
3. The sprouting of onion and potatoes can be delayed by the process of _____
 - (a) Freezing
 - (b) Irradiation
 - (c) Salting
 - (d) Canning
4. Food and Adulteration Act was enforced by Government of India in the year _____
 - (a) 1964
 - (b) 1954
 - (c) 1950
 - (d) 1963
5. An internal factor responsible for spoilage of food is _____
 - (a) Wax coating
 - (b) Contaminated utensils
 - (c) Moisture content in food
 - (d) Synthetic preservatives

Fill in the blanks:

1. Deficiency diseases can be prevented by taking _____ diet.

2. The process of affecting the natural composition and the quality of food substance is known as -----.
3. Vitamin D is called as ----- vitamin as it can be synthesised by the body from the rays of sunlight.
4. Dehydration is based on the principle of removal of -----.
5. Food should not be purchased beyond the date of -----.
6. AGMARK is used to certify ----- and ----- products in India.

State true or false. If false, correct the statement:

1. Iron is required for the proper functioning of thyroid gland.
2. Vitamins are required in large quantities for normal functioning of the body.
3. Vitamin C is a water soluble vitamin.
4. Lack of adequate fats in diet may result in low body weight.
5. ISI mark is mandatory to certify agricultural products.

Match the following:

Column A Column B

1. Calcium - Muscular fatigue
2. Sodium - Anaemia
3. Potassium - Osteoporosis
4. Iron - Goitre
5. Iodine - Muscular cramps

Give abbreviations for the following:

- i) ISI ii) FPO iii) AGMARK iv) FCI v) FSSAI

Consider the statements given below and choose the correct option:

Direction: In the following question, a statement of a Assertion is given and a corresponding Reason is given just below it. Of the statements given below, mark the correct answer as:

- (a) If both assertion and reason are true and the reason is the correct explanation of assertion.
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion
- (c) If assertion is true but reason is false
- (d) If both assertion and reason is false.

1. Assertion: Haemoglobin contains iron.

Reason: Iron deficiency leads to anaemia

2 Assertion: AGMARK is a quality control agency.

Reason: ISI is a symbol of quality.

Give reasons for the following statements.

- a. Salt is added as a preservative in pickles _____
- b. We should not eat food items beyond the expiry date _____
- c. Deficiency of calcium in diet leads to poor skeletal growth _____

Answers:

Choose the best answers:

1. vitamin 2. James Lind 3. Irradiation 4. 1954 5. Moisture content in food

Fill in the blanks:

1. Balanced 2. Food Spoilage 3. Calciferol 4. Water 5. Expiry 6. Livestock, Agricultural products

State true or false. If false, correct the statement:

- 1.False

Correct answer: Iodine is required for the proper functioning of thyroid gland

- 2.False

Correct answer: Vitamins are required in smaller quantities for normal functioning of the body

- 3.True

- 4.True

- 5.False

Correct answer: AGMARK is mandatory to certify agricultural products

Match the following:

- 1.Calcium- Osteoporosis
- 2.Sodium- Muscular cramps
- 3.Potassium- Muscular fatigue
- 4.Iron- Anaemia
- 5.Iodine- Goitre

Give abbreviations for the following:

- i. Indian Standards Institution ii. Fruit Process Order iii. Agricultural Marking
- iv. Food Corporation of India v. Food Safety and Standards Authority of India

Consider the statements given below and choose the correct option:

- 1. If both Assertion and Reason are true and the Reason is the correct explanation of Assertion
- 2. If both Assertion and Reason is false

Give reasons for the following statements.

- a. Salt helps in removal of moisture from food by process of Osmosis
- b. Eating a food beyond expiry date is harmful to the body

c. Calcium is important component of body. It is a macronutrient. Its is largely required for bone formation. Its deficiency results in poor skeletal growth

9th Science Lesson 22

22] World Of Microbes

Do You Know?

Antonie Van Leeuwenhoek, the first microbiologist designed his own microscope. In 1674, he took plaque from his own teeth and observed it under the microscope. He was astonished to see many tiny organisms moving around, which was otherwise invisible to naked eyes.

The protein free pathogenic RNA of virus is Viroids. They are found in plant cells and cause disease in plants.

World health Day - 7th April

World malaria day - 25th April

World AIDS day - 1st December

World Anti - Tuberculosis day-24th March

Robert Koch (Father of Bacteriology) is the first German physician to study how pathogens cause diseases. In 1876, he showed that the disease called anthrax of sheep was due to *Bacillus Anthracis* which exist in pastures in the form of protective spores.

Sir Ronald Ross, an Indian born British doctor, is famous for his work concerning malaria. He worked in the Indian Medical Service for 25 years. He identified the developing stages of malarial parasite in the gastrointestinal tract of mosquito and proved that malaria was transmitted by mosquito. In 1902, he received the Nobel Prize for Physiology or Medicine for his work on the transmission of malaria.

An extraction of tender leaves of papaya and herbal drink. Nilavembu Kudineer is given to dengue patients. It is known to increase the blood platelet count. (Source: AYUSH).

Swine flu first surfaced in April 2009 and affected millions of people. Then in June 2009 it was declared a pandemic by the World Health Organization (WHO). In 2015, India reportedly had over 31,000 people infected and 1,900 resulting deaths.

The avian influenza virus A (H5N1) emerged in 1996. It was first identified in Southern China and Hong Kong. H5N1 was first discovered in humans in 1997 by World Health Organisation. First outbreak was in December 2003.

HIV was first recognised in Hatai (USA) in 1981. In India the first confirmed evidence of AIDS infection was reported in April 1986 from Tamil Nadu. The AIDS vaccine RV 144 trial was conducted in Thailand in 2003 and reports were presented in 2011.

The process of vaccination was introduced by Edward Jenner. According to the World Health Organisation (WHO), Jennerian vaccination has eliminated small pox totally from the human population.

Louis Pasteur is an 18th century French chemist and microbiologist. He coined the term vaccine. Pasteur developed vaccine against chicken pox, cholera, anthrax, etc.

Choose the best answers:

1. Which of the following is transmitted through air?

- (a) Tuberculosis
- (b) Meningitis
- (c) Typhoid
- (d) Cholera

2. One of the means of indirect transmission of a disease is

- (a) Sneezing
- (b) Coughing
- (c) Vectors
- (d) Droplet infection

3. Diphtheria affects the

- (a) Lungs
- (b) Throat
- (c) Blood
- (d) Liver

4. The primary organ infected during tuberculosis is

- (a) Bone marrow
- (b) Intestine
- (c) Spleen
- (d) Lungs

5. Microbes that generally enter the body through nose are likely to affect

- (a) Gut
- (b) Lungs
- (c) Liver
- (d) Lymph Nodes

6. The organ affected by jaundice is

- (a) Liver
- (b) Lungs
- (c) Kidney
- (d) Brain

7. Poliomyelitis virus enters the body through

- (a) Skin
- (b) Mouth and nose
- (c) Ears
- (d) Eye

Fill in the blanks:

1. _____ break down organic matter and animal waste into ammonia.
2. Typhoid fever is caused by _____.
3. H1N1 virus causes _____.
4. _____ is a vector of viral disease dengue.
5. _____ vaccine gives considerable protection against tuberculosis.
6. Cholera is caused by _____ and malaria is caused by _____.

Expand the following:

1. ORS 2. HIV 3. DPT 4. WHO 5. BCG

Pick out the odd one:

- i) AIDS, Retrovirus, Lymphocytes, BCG.
- ii) Bacterial disease, Rabies, Cholera, Common cold and influenza.

State true or false. If false, correct the statement:

1. Rhizobium, associated with root nodules of leguminous plants fixes atmospheric nitrogen.
2. Non-infectious diseases remain confined to the person who develops the disease and do not spread to others.
3. The process of vaccination was developed by Jenner.
4. Hepatitis B is more dangerous than Hepatitis A.

Match the following:

1. Swine flu - Human Papilloma virus
2. Genital warts - Human Immunodeficiency Virus
3. AIDS - Mycobacterium
4. Tuberculosis - Influenza virus H1N1

Consider the statements given below and choose the correct option:

Mark the correct statement as:

- (a) If both A and R are true and R is correct Explanation of A.

(b) If both A and R are true but R is not the correct explanation of A.

(c) If A is true but R is false.

(d) If both A and R are false.

1. Assertion: Chicken pox is a disease indicated by scars and marks in the body.

Reason: Chicken pox causes rashes on face and further spreads throughout the body.

2. Assertion: Dengue can be treated by intake of antibiotics.

Reason: Antibiotics blocks the multiplication of viruses.

Answers:

Choose the best answers:

1. Tuberculosis 2. Vectors 3. Throat 4. Lungs 5. Lungs 6. Liver 7. Mouth & nose

Fill in the blanks:

1. Nitrification 2. Salmonella typhi 3. Swine flue 4. Aedes aegypti mosquito 5. BCG 6. Vibrio cholerae, Plasmodium

Expand the following:

1. Oral Rehydration Solution 2. Human Immunodeficiency virus 3. Diptheria, Pertussis and tetanus

4. World Health Organization 5. Bacillus Calmette Guerin

Pick out the odd one:

1. BCG 2. Rabies

State true or false. If false, correct the statement:

1. True

2. True

3. True

4. True

Match the following:

1. Swine flu- Influenza virus H1N1

2. Genital warts- Human Papilloma virus

3. AIDS- Human Immunodeficiency Virus

4. Tuberculosis- Mycobacterium

Consider the statements given below and choose the correct option:

1. If both A and R are true and R is correct explanation of A

2. If both A and R are false.

Do You Know?

Government of Tamil Nadu has launched Uzhavan (farmer) mobile application. It can be used by farmers to gather information on farm subsidies, farm equipments, crop insurance and weather conditions. It also provides information on available stock of seeds and fertilizers in local government and private stores.

Pradhan Mantri Fasal Bima Yojana (PMFBY) : It is an agricultural crops insurance scheme of Indian government. Under this scheme the central government provides insurance cover and financial assistance to farmers. It was launched on 18th February 2016.

Bio-fertilizer Scheme: Tamil Nadu Government has recently launched "Bio-fertiliser Scheme". It is aimed at better management of natural farming and helps to boost and maintain soil fertility.

The Council of Scientific and Industrial Research (CSIR) and National Botanical Research Institute (NBRI) and Central Institute for Medicinal and Aromatic Plants (CIMAP) have jointly launched India's first anti diabetic ayurvedic drug BGR-34 (BGR-Blood Glucose Regulator). It contains 34 identified active phytoconstituents from herbal resources. It works by controlling blood sugar levels.

Indigenous Draught Breeds- Native to Tamil Nadu:

Kangayam: It originated in Kangayam and is observed in Dharapuram, Perundurai, Erode, Bhavani and part of Gobichettipalayam taluk of Erode and Coimbatore district.

Pulikulam: This breed is commonly seen in Cumbum valley of Madurai district in Tamil Nadu. It is also known as Jallikattu madu, they are mainly used for penning in the field and useful for ploughing.

Dr. Verghese Kurein, was the founder of National Dairy Development Board (NDDB) and was called the Architect of India's Modern Dairy Industry and the Father of White Revolution. NDDB designed and implemented the world's largest dairy development programme called OPERATION FLOOD.

Tamil Nadu is a leading state endowed with rich fishery resources from Marine, Inland and Coastal Aquaculture. The marine fisheries potential of the state is estimated at 0.719 million tonnes. The inland fishery resources have a potential to yield 4.5 lakh metric tonnes of fishes. Tamil Nadu ranks sixth among the maritime states in coastal farming.

The Central Marine Fisheries Research Institute (CMFRI) was established by the Government of India in 1947 at Cochin, Kerala State. Its main focus is on marine fisheries landings, research on taxonomy and bio-economic characteristics of marine organisms.

The Central Institute of Brackish Water Aquaculture (CIBA) was established in 1987 with its headquarters at Chennai. The objective of CIBA is management of sustainable culture system for fin fish and shell fish in brackish water. CIBA assists small aqua-farmers in fin fish and shrimp farming by providing sustainable modern technologies.

Honey bee visits 50 to 100 flowers during a collection trip. Average bee will make only 1/12th of a teaspoon of honey in its lifetime. One kilogram of honey contains 3200 calories and is an energy rich food.

Choose the best answers:

1. The production and management of fish is called.

(a) Pisciculture

(b) Sericulture

(c) Aquaculture

(d) Monoculture

2. Which one of the following is not an exotic breed of cow?

(a) Jersey

(b) Holstein-Friesian

(c) Sahiwal

(d) Brown Swiss

3. Which one of the following is an Italian species of honey bee?

(a) Apis Mellifera

(b) Apis Dorsata

(c) Apis Florae

(d) Apis Cerana

4. Which one of the following is not an Indian major carp?

(a) Rohu

(b) Catla

(c) Mrigal

(d) Singhara

5. Drones in the honey bee colony are formed from

(a) Unfertilized egg

(b) Fertilized egg

(c) Parthenogenesis

(d) Both b and c

6. Which of the following is a high milk yielding variety of cow?

(a) Holstein-Friesian

(b) Dorset

(c) Sahiwal

(d) Red Sindhi

7. Which Indian variety of honey bee is commonly used for apiculture?

(a) Apis Dorsata

(b) Apis Florea

(c) Apis mellifera

(d) Apis Indica

8. _____ is the method of growing plants without soil.

(a) Horticulture

(b) Hydroponics

(c) Pomology

(d) None of these

9. The symbiotic association of fungi and vascular plants is

(a) Lichen

(b) Rhizobium

(c) Mycorrhizae

(d) Azotobacter

10. The plant body of mushroom is

(a) Spawn

(b) Mycelium

(c) Leaf

(d) All of these

Fill in the blanks:

1. Quinine drug is obtained from _____.

2. Carica papaya leaf can cure _____ disease.

3. Vermicompost is a type of soil made by _____ and microorganisms.

4. _____ refers to the culture of prawns, pearl and edible oysters.

5. The largest member in a honey bee hive is the _____.

6. _____ is a preservative in honey.

7. _____ is the method of culturing different variety of fish in a water body.

State true or false. If false, correct the statement:

1. Mycorrhiza is an alga.

2. Milch animals are used in agriculture and transport.

3. Apis florae is a rock bee.

4. Ongole is an exotic breed of cattle.

5. Sheep manure contains high nutrients than farm yard manure.

Match the following:

Column A Column B

1. Lobsters - Marine fish
2. Catla - Pearl
3. Sea bass - Shell fish
4. Oysters - Paddy
5. Pokkali - Fin fish
6. Pleurotus sps - Psoriasis
7. Sarpagandha - Oyster mushroom
8. Olericulture - Reserpine
9. Wrightia tinctoria - Vegetable farming

Answers:

Choose the best answers:

1. Pisciculture 2. Sahiwal 3. Apis mellifera 4. Singhara 5. fertilized egg 6. Holstein- Friesian 7. Apis indica 8. Hydroponics
9. Mycorrhizae 10. Leaf

Fill in the blanks:

1. Cinchona officinalis 2. Dengue fever 3. Earthworms 4. Aquaculture 5. Queen 6. Formic acid 7. Polyculture

State true or false. If false, correct the statement:

1.False

Correct answer: Mycorrhiza is Fungi

2.False

Correct answer: Milch animals are used in milk production only

3.False

Correct answer: Apis florea is a little bee

4.False

Correct answer: Ongole is a dual purpose breed of cattle

5.True

Match the following:

- 1.Lobsters- Shell fish
- 2.Catla - Fin fish
- 3.Sea bass - Marine fish
- 4.Oysters - Pearl

- 5. Pokkali - Paddy
- 6. Pleurotus spp - Oyster mushroom
- 7. Sarpagandha - Reserpine
- 8. Olericulture - Vegetable farming
- 9. Wrightia tinctoria - Psoriasis

9th Science Lesson 24

24] Environmental Science

Do You Know?

Earthworms are referred to as 'Farmer's friend'. After digesting organic matter, earthworms excrete a nutrient-rich waste product called castings which is used as Vermicompost.

World Water Day on 22nd March every year is about focusing attention on the importance of water.

IUCN was founded on 5th October 1948 at Gland, Switzerland.

Choose the best answers:

1. All the factors of biosphere which affect the ability of organisms to survive and reproduce are called as _____

- (a) Biological factors
- (b) Abiotic factors
- (c) Biotic factors
- (d) Physical factors.

2. The ice sheets from the north and south poles and the icecaps on the mountains, get converted into water vapour through the process of _____

- (a) Evaporation
- (b) Condensation
- (c) Sublimation
- (d) Infiltration

3. The atmospheric carbon dioxide enters into the plants through the process of _____

- (a) Photosynthesis
- (b) assimilation
- (c) Respiration
- (d) Decomposition

4. Increased amount of _____ in the atmosphere, results in greenhouse effect and global warming.

- (a) Carbon monoxide

(b) Sulphur dioxide

(c) Nitrogen dioxide

(d) Carbon dioxide

Match the following:

Microorganism Role played

1. Nitrosomonas - Nitrogen fixation
2. Azotobacter - Ammonification
3. Pseudomonas species - Nitrification
4. Putrefying bacteria - Denitrification

State true or false. If false, correct the statement:

1. Nitrogen is a greenhouse gas.
2. Poorly developed root is an adaptation of mesophytes.
3. Bats are the only mammals that can fly.
4. Earthworms use the remarkable high frequency system called echoes.
5. Aestivation is an adaptation to overcome cold condition.

Answers:

Choose the best answers:

1. abiotic factors 2. Evaporation 3. Photosynthesis 4. carbon dioxide

Match the following:

1. Nitrosomonas - Ammonification
2. Azotobacter - Denitrification
3. Pseudomonas species - Nitrogen fixation
4. Putrefying bacteria - Nitrification

State true or false. If false, correct the statement:

1. False

Correct answer: Nitrogen is not a green house gas

2. False

Correct answer: Mesophytes roots are well developed provided with root caps

3. True

4. False

Correct answer: Bats use the remarkable high frequency system called echoes

5. False

Correct answer: Aestivation is an adaptation to overcome hot and dry condition

Choose the best answers:

1. _____ is a structured delivery of information.

- (a) Slide show
- (b) Page
- (c) WordArt
- (d) Presentation

2. The slides are grouped together in a sequence to form _____

- (a) Slide show
- (b) Sharts
- (c) Page
- (d) Messages

3. A presentation consists of many _____

- (a) Pages
- (b) Slides
- (c) Placeholders
- (d) Messages

4. Which key should be pressed to run a slide show?

- (a) F1
- (b) Tab
- (c) F5
- (d) F2

5. _____ is used to insert attractive text in the slide.

- (a) Slide show
- (b) Word Art
- (c) Text
- (d) Header and footer

Answers:**Choose the best answers:**

10th Science Lesson 1**1] Law Of Motion****Choose the best answers:**

1. Inertia of a body depends on

- (a) Weight of the object
- (b) Acceleration due to gravity of the planet
- (c) Mass of the object
- (d) Both a & b

2. Impulse is equal to

- (a) Rate of change of momentum
- (b) Rate of force and time
- (c) Change of momentum
- (d) Rate of change of mass

3. Newton's III law is applicable

- (a) For a body is at rest
- (b) For a body in motion
- (c) Both a & b
- (d) Only for bodies with equal masses

4. Plotting a graph for momentum on the X-axis and time on Y-axis. Slope of momentum – time graph gives

- (a) Impulsive force
- (b) Acceleration
- (c) Force
- (d) Rate of force

5. In which of the following sport the turning of effect of force used

- (a) Swimming
- (b) Tennis
- (c) Cycling
- (d) Hockey

6. The unit of 'g' is ms^{-2} . It can be also expresses as

- (a) cms^{-1}
- (b) Nkg^{-1}
- (c) $\text{Nm}^2\text{kg}^{-1}$
- (d) cm^2s^{-2}

7. One-kilogram force equals to

- (a) 9.8 dyne
- (b) $9.8 \times 10^4 \text{ N}$
- (c) $98 \times 10^4 \text{ dyne}$
- (d) 980 dyne

8. The mass of a body is measured on planet Earth as M kg. When it is taken to a planet of radius half that of the Earth then its value will be _____ kg

- (a) 4 M
- (b) 2 M
- (c) $M/4$
- (d) M

9. If the Earth shrinks to 50% of its real radius its mass remaining the same, the weight of a body on the Earth will

- (a) Decrease by 50%
- (b) increase by 50%
- (c) Decrease by 25%
- (d) increase by 300%

10. To project the rockets which of the following principle(s) is / (are) required?

- (a) Newton's third law of motion
- (b) Newton's law of gravitation
- (c) Law of conservation of linear momentum
- (d) Both a and c

Fill in the blanks:

1. To produce a displacement _____ is required.

- a. Mass
- b. Momentum

c. Torque

d. Force

2. Passengers lean forward when sudden brake is applied in a moving vehicle. This can be explained by _____.

a. the inertia of motion

b. acceleration due to gravity

c. Speed of the vehicle

d. Mass of the vehicle

3. By convention, the clockwise moments are taken as _____ and the anticlockwise moments are taken as _____.

a. Increasing, Decreasing

b. Positive, Negative

c. Negative, Positive

d. Decreasing, Increasing

4. _____ is used to change the speed of car.

a. Torque

b. Power

c. acceleration

d. External Force

5. A man of mass 100 kg has a weight of _____ at the surface of the Earth.

a. 0.98N

b. $98 \times 10^2 \text{ N}$

c. 0N

d. 980N

State true or false. If false, correct the statement:

1. The linear momentum of a system of particles is always conserved.

2. Apparent weight of a person is always equal to his actual weight.

3. Weight of a body is greater at the equator and less at the polar region.

4. Turning a nut with a spanner having a short handle is so easy than one with a long handle.

5. There is no gravity in the orbiting space station around the Earth. So the astronauts feel weightlessness.

Match the following:

Column I Column II

- a. Newton's I law - propulsion of a rocket
- b. Newton's II law - stable equilibrium of a body
- c. Newton's III law - law of force
- d. Law of conservation of Linear momentum - flying nature of bird

Consider the statements given below and choose the correct option:

Mark the correct choice as

- (a) If both assertion and reason are true and reason is the correct explanation of assertion
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion
- (c) If assertion is true but reason is false
- (d) If assertion is false but reason is true

1. Assertion: The sum of the clockwise moments is equal to the sum of the anticlockwise moments.

Reason: The principle of conservation of momentum is valid if the external force on the system is zero.

2. Assertion: The value of 'g' decreases as height and depth increases from the surface of the Earth.

Reason: 'g' depends on the mass of the object and the Earth.

Answers:**Choose the best answer:**

- 1. Mass of the object 2. Change of Momentum 3. Both a and b 4. Force
- 5. Cycling 6. Nkg^{-1} 7. 9.8×10^4 dyne 8. $M/4$ 9. Decrease by 25% 10. Newton's third law of motion

Fill in the Blanks:

1. Force 2. Inertia of the motion 3. Positive, Negative 4. Acceleration 5. 980N

True or False:

- 1. False (The Linear momentum of a system of particles is always conserved if no external force acts on it)
- 2. False (Apparent weight of a person varies according to the vertical movement of that person)
- 3. False (Weight of a body is greater in the polar region and lesser in the equatorial region)
- 4. False (Turning a nut with a short handle is harder than the one with a long handle)
- 5. False (There is gravity in the orbiting space and the astronauts are in the state of free fall)

Match the following:

- a. stable equilibrium of a body
- b. flying nature of bird
- c. propulsion of a rocket
- d. law of force

Assertion and Reasoning:

1. Both assertion and reason are true but reason is not the correct explanation of assertion
2. Assertion is true but reason is false
(mass 'm' depends on the gravity 'g' of the earth)

10th Science Lesson 2

2] Optics

Do You Know?

- Colloid is a microscopically small substance that is equally dispersed throughout another material. Example: Milk, Ice cream, muddy water, smoke.
- The lens formula and lens maker's formula are applicable to only thin lenses. In the case of thick lenses, these formulae with little modifications are used.

Choose the best answers:

1. The refractive index of four substances A, B, C and D are 1.31, 1.43, 1.33, 2.4 respectively, the speed of light is maximum in
 - (a) A
 - (b) B
 - (c) C
 - (d) D
2. Where should an object be placed so that a real and inverted image of same size is obtained by a convex lens
 - (a) f
 - (b) 2f
 - (c) infinity
 - (d) between f and 2f
3. A small bulb is placed at the principle focus of a convex lens. When the bulb is switched on, the lens will produce
 - (a) A convergent beam of light
 - (b) A divergent beam of light
 - (c) A parallel beam of light
 - (d) A coloured beam of light
4. Magnification of a convex lens is
 - (a) Positive
 - (b) Negative
 - (c) either positive or negative

(d) Zero

5. A convex lens forms a real, diminished point sized image at focus. Then the position of the object is at

(a) Focus

(b) Infinity

(c) At $2f$

(d) Between f and $2f$

6. Power of a lens is $-4D$, then its focal length is

(a) $4m$

(b) $-40m$

(c) $-0.25 m$

(d) $-2.5 m$

7. In a myopic eye, the image of the object is formed

(a) Behind the retina

(b) On the retina

(c) In front of the retina

(d) On the blind spot

8. The eye defect 'presbyopia' can be corrected by

(a) Convex lens

(b) Concave lens

(c) Convex mirror

(d) Bifocal lenses

9. Which of the following lens would you prefer to use while reading small letters found in a dictionary?

(a) A convex lens of focal length $5 cm$

(b) A concave lens of focal length $5 cm$

(c) A convex lens of focal length $10 cm$

(d) A concave lens of focal length $10 cm$

10. If V_B , V_G , V_R be the velocity of blue, green and red light respectively in a glass prism, then which of the following statement gives the correct relation?

(a) $V_B = V_G = V_R$

(b) $V_B > V_G > V_R$

(c) $V_B < V_G < V_R$

(d) $V_B < V_G > V_R$

Fill in the blanks:

1. The path of the light is called as _____.

- a. beam of light
- b. source of light
- c. ray of light
- d. angle of light

2. The refractive index of a transparent medium is always greater than _____.

- a. 1
- b. 0
- c. 1.5
- d. -1

3. If the energy of incident beam and the scattered beam are same, then the scattering of light is called as _____ scattering.

- a. elastic scattering
- b. Rayleigh's Scattering
- c. Mie Scattering
- d. None of the above

4. According to Rayleigh's scattering law, the amount of scattering of light is inversely proportional to the fourth power of its _____.

- a. focal length
- b. refractive index
- c. Wave length
- d. Medium

5. Amount of light entering into the eye is controlled by _____.

- a. cornea
- b. iris
- c. pupil
- d. retina

State true or false:

1. Velocity of light is greater in denser medium than in rarer medium.

2. The power of lens depends on the focal length of the lens.
3. Increase in the converging power of eye lens cause 'hypermetropia'.
4. The convex lens always gives small virtual image.

Match the following:

Column – I Column – II

1. Retina - path way of light
2. Pupil - far point comes closer
3. Ciliary muscles - near point moves away
4. Myopia - screen of the eye
5. Hypermetropia - power of accommodation

Consider the statements given below and choose the correct option:

Mark the correct choice as

- (a) If both assertion and reason are true and reason is the correct explanation of assertion
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion
- (c) If assertion is true but reason is false
- (d) If assertion is false but reason is true

1. Assertion: If the refractive index of the medium is high (denser medium) the velocity of the light in that medium will be small.

Reason: Refractive index of the medium is inversely proportional to the velocity of the light.

2. Assertion: Myopia is due to the increase in the converging power of eye lens.

Reason: Myopia can be corrected with the help of concave lens.

Answers:**Choose the best answer:**

1. 31 2. $2f$ 3. A parallel beam of light 3. Positive 4. Positive 5. Infinity 6. $-0.25m$ 7. In front of the retina 8. Bi focal lenses
9. A convex lens of focal length 10cm 10. $V_B < V_G < V_R$

Fill in the blanks:

1. Ray of light 2. One (1) 3. Elastic scattering 4. Wavelength 5. Iris

True or False:

1. False (Velocity of light is greater in the rarer medium than in the denser medium)
2. True
3. True

4. False (The convex lens forms enlarged and virtual image when placed between p and f)

Match the following:

1. Screen of the eye 2. Path way of light 3. Power of accommodation 4. Far point comes closer
5. Near point moves away

Assertion and Reason:

1. Both assertion and reason are true and reason is the correct explanation of assertion
2. Both assertion and reason are true but reason is not the correct explanation of assertion

10th Science Lesson 3

3] Thermal Physics

Choose the best answers:

1. The value of universal gas constant

- (a) $3.81 \text{ Jmol}^{-1} \text{ K}^{-1}$
(b) $8.03 \text{ Jmol}^{-1} \text{ K}^{-1}$
(c) $1.38 \text{ Jmol}^{-1} \text{ K}^{-1}$
(d) $8.31 \text{ Jmol}^{-1} \text{ K}^{-1}$

2. If substance is heated or cooled, the change in mass of that substance is

- (a) Positive
(b) Negative
(c) Zero
(d) None of the above

3. If a substance is heated or cooled, the linear expansion occurs along the axis of

- (A) X or $-X$
(b) Y or $-Y$
(c) Both (a) and (b)
(d) (a) or (b)

4. Temperature is the average _____ of the molecules of a substance

- (a) Difference in K.E and P.E
(b) Sum of P.E and K.E
(c) Difference in T.E and P.E
(d) Difference in K.E and T.E



5. In the given diagram, the possible direction of heat energy transformation is

- (a) $A \leftarrow B, A \leftarrow C, B \leftarrow C$
- (b) $A \rightarrow B, A \rightarrow C, B \rightarrow C$
- (c) $A \rightarrow B, A \leftarrow C, B \rightarrow C$
- (d) $A \leftarrow B, A \rightarrow C, B \leftarrow C$

Fill in the blanks:

1. The value of Avogadro number _____.

- a. 6.032×10^{23}
- b. 6.023×10^{23}
- c. 6.023×10^{25}
- d. 6.032×10^{25}

2. The temperature and heat are _____ quantities.

- a. vector
- b. scalar
- c. molecular
- d. atomic

3. One calorie is the amount of heat energy required to raise the temperature of _____ of water through _____.

- a. 1mg, 1°C
- b. 1kg, 1°C
- c. 1g, 1°C
- d. 1kg, 10°C

4. According to Boyle's law, the shape of the graph between pressure and reciprocal of volume is _____.

- a. curve
- b. square
- c. Parallel
- d. straight line

State true or false. If false, explain why?

1. For a given heat in liquid, the apparent expansion is more than that of real expansion.

2. Thermal energy always flows from a system at higher temperature to a system at lower temperature.

3. According to Charles's law, at constant pressure, the temperature is inversely proportional to volume.

Match the items in column – I to the items in column – II:

Column – I Column – II

1. Linear expansion - change in volume
2. Superficial expansion - hot body to cold body
3. Cubical expansion - $1.381 \times 10^{-23} \text{ JK}^{-1}$
4. Heat transformation - change in length
5. Boltzmann constant - change in area

Consider the statements given below and choose the correct option:

- (a) If both assertion and reason are true and reason is the correct explanation of assertion
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion
- (c) If assertion is true but reason is false
- (d) If assertion is false but reason is true

1. Assertion: There is no effect on other end when one end of the rod is only heated.

Reason: Heat always flows from a region of lower temperature to higher temperature of the rod.

2. Assertion: Gas is highly compressible than solid and liquid.

Reason: Inter-atomic or intermolecular distance in the gas is comparably high.

Answers:

Choose the best answer:

1. $8.31 \text{ J mol}^{-1} \text{ K}^{-1}$ 2. Zero 3. X or $-X$ 4. Difference of T.E and P.E 5. $A \leftarrow B, A \leftarrow C, B \leftarrow C$.

Fill in the Blanks:

1. 6.023×10^{23} 2. Scalar 3. $1 \text{ gm}, 1^\circ\text{C}$ 4. Straight line

True or False:

1. False
2. True
3. False (At constant pressure, the volume is directly proportional to the temperature)

Match the following:

1. Change in length 2. Change in area 3. Change in volume 4. Hot body to cold body 5. $1.381 \times 10^{-23} \text{ JK}^{-1}$

Assertion and Reason:

1. Assertion is true but reason is false

2. Both assertion and reason are true and reason is the correct explanation of assertion.

10th Science Lesson 4

4| Electricity

Do You Know?

Nichrome is a conductor with highest resistivity equal to $1.5 \times 10^{-6} \Omega \text{ m}$. Hence, it is used in making heating elements.

HORSE POWER: The horse power (hp) is a unit in the foot-pound-second (fps) or English system, sometimes used to express the electrical power. It is equal to 746 watts.

In India, domestic circuits are supplied with an alternating current of potential 220/230 V and frequency 50 Hz. In countries like USA and UK, domestic circuits are supplied with an alternating current of potential 110/120 V and frequency 60 Hz.

Choose the best answers:

1. Which of the following is correct?

- (a) Rate of change of charge is electrical power
- (b) Rate of change of charge is current
- (c) Rate of change of energy is current
- (d) Rate of change of current is charge

2. SI unit of resistance is

- (a) mho
- (b) joule
- (c) ohm
- (d) ohm meter

3. In a simple circuit, why does the bulb glow when you close the switch?

- (a) The switch produces electricity
- (b) Closing the switch completes the circuit
- (c) Closing the switch breaks the circuit
- (d) The bulb is getting charged

4. Kilowatt hour is the unit of

- (a) Resistivity
- (b) Conductivity
- (c) Electrical energy

(d) Electrical power

Fill in the blanks:

1. When a circuit is open, _____ cannot pass through it.
 - a. charge
 - b. energy
 - c. power
 - d. current
2. The ratio of the potential difference to the current is known as _____.
 - a. Voltage
 - b. electric potential
 - c. power
 - d. resistance
3. The wiring in a house consists of _____ circuit.
 - a. domestic
 - b. industrial
 - c. home
 - d. building
4. The power of an electric device is a product of _____ and _____.
 - a. electric charge, resistance
 - b. electric current, resistance
 - c. electric charge, potential difference
 - d. electric current, potential difference
5. LED stands for _____.
 - a. Light Extracting Device
 - b. Light Emitting Diode
 - c. Light Emitting Device
 - d. Light Extracting Diode

State true or false. If false, correct the statement:

1. Ohm's law states the relationship between power and voltage.
2. MCB is used to protect house hold electrical appliances.

3. The SI unit for electric current is the coulomb.

4. One unit of electrical energy consumed is equal to 1000 kilowatt hour.

5. The effective resistance of three resistors connected in series is lesser than the lowest of the individual resistances.

Match the items in column – I to the items in column – II:

Column – I Column – II

(i) Electric current - volt

(ii) Potential difference - ohm meter

(iii) Specific resistance - watt

(iv) Electrical power - joule

(v) Electrical energy – ampere

Consider the statements given below and choose the correct option:

Mark the correct choice as

(a) If both assertion and reason are true and reason is the correct explanation of assertion

(b) If both assertion and reason are true but reason is not the correct explanation of assertion

(c) If assertion is true but reason is false

(d) If assertion is false but reason is true

1. Assertion: Electric appliances with a metallic body have three wire connections.

Reason: Three pin connections reduce heating of the connecting wires.

2. Assertion: In a simple battery circuit the point of highest potential is the positive terminal of the battery.

Reason: The current flows towards the point of the highest potential.

3. Assertion: LED bulbs are far better than incandescent bulbs.

Reason: LED bulbs consume less power than incandescent bulbs.

Answers:

Choose the best answers:

1. Rate of change of charge is current 2. Ohm 3. Closing the switch closes the circuit 4. Electrical Energy

Fill in the Blanks:

1. Current 2. Resistance 3. Domestic circuit 4. Electric current and Potential difference 5. Light Emitting Diode

True or False:

1. False (Ohm's law states that relationship between current and voltage).

2. True

3.False (The SI unit of electric current is Ampere(A))

4.False (One unit = One Kwh)

5.False (The effective resistance is greater than the resistance of Individual resistors)

Match the following:

i) Ampere ii) Volt iii) ohm meter iv) Joule v) Watt

Assertion and Reason:

1.Assertion is true but reason is false.

2.Assertion is true but reason is false.

3.Both assertion and reason are true and reason is the correct explanation of assertion.

10th Science Lesson 5

5] Acoustics

Do You Know?

Acoustical wonder of Golconda fort (Hyderabad, Telangana) : The Clapping portico in Golconda Fort is a series of arches on one side, each smaller than the preceding one. So, a sound wave generated under the dome would get compressed and then bounce back amplified sufficiently to reach a considerable distance.

What is meant by rarer and denser medium? The medium in which the velocity of sound increases compared to other medium is called rarer medium. (Water is rarer compared to air for sound). The medium in which the velocity of sound decreases compared to other medium is called denser medium. (Air is denser compared to water for sound).

Whispering Gallery: One of the famous whispering galleries is in. St. Paul's cathedral church in London. It is built with elliptically shaped walls. When a person is talking at one focus, his voice can be heard distinctly at the other focus. It is due to the multiple reflections of sound waves from the curved walls.

Whenever there is a relative motion between a source and a listener, the frequency of the sound heard by the listener is different from the original frequency of sound emitted by the source. This is known as "Doppler effect".

Choose the best answers:

1. When a sound waves travels through air, the air particles

(a) Vibrate along the direction of the wave motion

(b) Vibrate but not in any fixed direction

(c) Vibrate perpendicular to the direction of the wave motion

(d) Do not vibrate

2. Velocity of sound in a gaseous medium is 330 ms^{-1} . If the pressure is increased by 4 times without causing in the temperature, the velocity of sound in the gas is

(a) 330 ms^{-1}

(b) 660 ms^{-1}

(c) 156 ms^{-1}

(d) 990 ms^{-1}

3. The frequency which is audible to the human ear is

(a) 50 kHz

(b) 20kHz

(c) 15000kHz

(d) 10000kHz

4. The velocity of sound in air at a particular temperature is 330 ms^{-1} . What will be its value when temperature is doubled and the pressure is halved?

(a) 330 ms^{-1}

(b) 165 ms^{-1}

(c) $330 \times \sqrt{2} \text{ ms}^{-1}$

(d) $320 / \sqrt{2} \text{ ms}^{-1}$

5. If a sound waves travels with a frequency of $1.25 \times 10^4 \text{ Hz}$ at 344 ms^{-1} , the wave length will be

(a) 27.52 m

(b) 275.2 m

(c) 0.02752 m

(d) 2.752 m

6. The sound waves are reflected from an obstacle into the same medium from which they were incident. Which of the following changes?

(a) Speed

(b) Frequency

(c) Wavelength

(d) None of these

7. Velocity of sound in the atmosphere of a planet is 500 ms^{-1} . The minimum distance between the sources of sound and the obstacle to hear the echo, should be

(a) 17 m

(b) 20m

(c) 25m

(d) 50m

Fill in the blanks:

1. Rapid back and forth motion of a particle about its mean position is called _____.

- a. particular movement
- b. vibrations
- c. molecular movement
- d. acoustics

2. If the energy in a longitudinal wave travels from south to north, the particles of the medium would be vibrating in _____.

- a. only north
- b. only east
- c. both north and south
- d. both east and west

3. A whistle giving out a sound of frequency 450 Hz, approaches a stationary observer at a speed of 33 ms^{-1} . The frequency heard by the observer is (speed of sound = 330 ms^{-1}) _____.

- a. 500 Hz
- b. 550 Hz
- c. 300 Hz
- d. 510 Hz

4. A source of sound is travelling with a velocity 40 km/h towards an observer and emits a sound of frequency 2000 Hz. If the velocity of sound is 1220 km/h, then the apparent frequency heard by the observer is _____.

- a. 2067 Hz
- b. 2068 Hz
- c. 2065 Hz
- d. 2066 Hz

State true or false. If false, correct the statement:

- 1. Sound can travel through solids, gases, liquids and even vacuum.
- 2. Waves created by Earth Quake are Infrasonic.
- 3. The velocity of sound is independent of temperature.
- 4. The velocity of sound is high in gases than liquids.

Match the following:

- 1. Infrasonic - compressions
- 2. Echo - 22 kHz

3. Ultrasonic - 10 Hz

4. High pressure region – ultrasonography

Consider the statements given below and choose the correct option:

Mark the correct choice as

- (a) If both assertion and reason are true and reason is the correct explanation of assertion
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion
- (c) If assertion is true but reason is false
- (d) If assertion is false but reason is true

1. Assertion: The change in air pressure affects the speed of sound.

Reason: The speed of sound in a gas is proportional to the square of the pressure.

2. Assertion: Sound travels faster in solids than in gases.

Reason: Solid possesses a greater density than that of gases.

Answers:

Choose the best answers:

1. Vibrate along the direction of the wave motion 2. 330 ms^{-1} 3. 20Hz 4. 330 ms^{-1} 5. 0.02752m 6. None of these 7. 25m

Fill in the Blanks:

1. Vibrations 2. Both north and south 3. 500 Hz 4. 2068 Hz

True or False:

- 1. False (sound can travel in solids, gases and liquids but can't travel through vacuum)
- 2. True
- 3. False (Velocity of sound is independent of gas pressure but dependent of Temperature)
- 4. False (Velocity of sound is greater in the liquids and solids than gases – $V_s < V_L < V_g$)

Match the following:

1. 10Hz 2. Ultrasonography 3. 22kHz 4. Compressions

Reason and Assertions:

- 1. Both assertion and reason are true and reason is the correct explanation of assertion.
- 2. Both assertion and reason are true but reason is not the correct explanation of assertion.

10th Science Lesson 6

6] Nuclear Physics

Do You Know?

There have been 29 radioactive substances discovered so far. Most of them are rare earth metals and transition metals.

Uranium, named after the planet Uranus, was discovered by Martin Klaproth, a German chemist in a mineral called pitchblende.

Electron Volt (eV) is the unit used in nuclear physics to measure the energy of small particles. It is nothing but the energy of one electron when it is accelerated using an electric potential of one volt.

$1 \text{ eV} = 1.602 \times 10^{-19} \text{ joule}$.

1 million electron volt = 1 MeV = 10^6 eV (mega electron volt)

The energy released in a nuclear fission process is about 200 MeV.

Nuclear fusion is the combination of two lighter nuclei. The charge of both nuclei is positive. According to electrostatic theory, when they come closer they tend to repel each other. This repulsive force will be overcome by the kinetic energy of the nuclei at higher temperature of the order of 10^7 to 10^9 K .

The nuclear bomb that was dropped in Hiroshima during World War II was called as 'Little boy'. It was a gun-typed bomb which used a uranium core. The bomb, which was subsequently dropped over Nagasaki was called as 'Fat man'. It was an explosion type bomb, which used a plutonium core.

Sun fuses about 620 million metric tons radiates about $3.8 \times 10^{26} \text{ joule}$ of energy per second. When this energy is radiated towards the Earth, it decreases in its intensity. When it reaches the Earth its value is about 1.4 kilo joule per unit area in unit time.

How old is our mother Earth? Any guess?? It is nearly 4.54×10^9 years (around 45 Crore 40 lakh years). Wow!!

Dosimeter is a device used to detect the levels of exposure to an ionizing radiation. It is frequently used in the environments where exposure to radiation may occurs such as nuclear power plants and medical imaging facilities. Pocket dosimeter is used to provide the wearer with an immediate reading of his/her exposure to X-rays and γ rays.

Choose the best answers:

1. Man – made radioactivity is also known as _____

- (a) Induced radioactivity
- (b) Spontaneous radioactivity
- (c) Artificial radioactivity
- (d) a & c

2. Unit of radioactivity is _____

- (a) Roentgen
- (b) Cuie

(c) Becquerel

(d) All the above

3. Artificial radioactivity was discovered by _____

(a) Bequerel

(b) Irene Curie

(c) Roentgen

(d) Neils Bohr

4. In which of the following, no change in mass number of the daughter nuclei takes place

i) α decay ii) β decay iii) γ decay iv) Neutron decay

(a) (i) is correct

(b) (ii) and (iii) are correct

(c) (i) & (iv) are correct

(d) (ii) & (iv) are correct

5. _____ isotope is used for the treatment of cancer.

(a) Radio Iodine

(b) Radio Cobalt

(c) Radio Carbon

(d) Nickel

6. Gamma radiations are dangerous because

(a) It affects eyes & bones

(b) it affects tissues

(c) It produces genetic disorder

(d) It produces enormous amount of heat

7. _____ aprons are used to protect us from gamma radiations.

(a) Lead oxide

(b) Iron

(c) Lead

(d) Aluminium

8. Which of the following statements is/are correct?

i. α particles are photons

ii. Penetrating power of γ radiation is very low

iii. Ionization power is maximum for α rays

iv. Penetrating power of γ radiation is very high

(a) (i) & (ii) are correct

(b) (ii) & (iii) are correct

(c) (iv) only correct

(d) (iii) & (iv) are correct

9. Proton – Proton chain reaction is an example of _____

(a) Nuclear fission

(b) α – decay

(c) Nuclear fusion

(d) β – decay

10. In the nuclear reaction ${}_6X^{12} \xrightarrow{\alpha \text{ decay}} {}_Z Y^A$, the value of A & Z.

(a) 8, 6

(b) 8, 4

(c) 4, 8

(d) Cannot be determined with the given data

11. Kamini reactor is located at _____

(a) Kalpakkam

(b) Koodankulam

(c) Mumbai

(d) Rajasthan

12. Which of the following is/are correct?

i. Chain reaction takes place in a nuclear reactor and an atomic bomb.

ii. The chain reaction in a nuclear reactor is controlled.

iii. The chain reaction in a nuclear reactor is not controlled.

iv. No chain reaction takes place in an atom bomb.

Fill in the blanks:

1. One roentgen is equal to _____ disintegrations per second.

a) 3.7×10^9

b) 3.7×10^{10}

c) 3.7×10^{11}

d) 3.7×10^{12}

2. Positron is an _____

- a) Anti particle of electron
- b) Anti particle of neutron
- c) Anti particle of proton
- d) None of the above

3. Anaemia can be cured by _____ isotope.

- a) Radio Cobalt
- b) Radio Sodium
- c) Radio Iron
- d) None of the above

4. Abbreviation of ICRP _____.

- a) International Commission on Radiological Prevention.
- b) International Convention on Radiological Prevention.
- c) International Convention on Radiological Protection.
- d) International Commission on Radiological Protection.

5. _____ is used to measure exposure rate of radiation in humans.

- a) Roentgen
- b) Becquerel
- c) Curie
- d) All the above

6. _____ has the greatest penetration power.

- a) Alpha rays
- b) Beta rays
- c) Gamma rays
- d) Delta rays

7. ${}_Z Y^A \rightarrow {}_{Z+1} Y^A + X$; Then, X is _____.

- a) ${}_1 e^0$
- b) ${}_2 e^0$
- c) ${}_3 e^0$
- d) ${}_4 e^0$

8. ${}_Z X^A \rightarrow {}_Z Y^A$ This reaction is possible in _____ decay.

- a) Beta
- b) Alpha
- c) Delta
- d) Gamma

9. The average energy released in each fusion reaction is about _____ J.

a) 3.86×10^{-12}

b) 3.86×10^{-24}

c) 3.84×10^{-24}

d) 3.84×10^{-12}

10. Nuclear fusion is possible only at an extremely high temperature of the order of _____ K.

a) 10^7 to 10^9

b) 10^7 to 10^{10}

c) 10^7 to 10^{11}

d) All the above

11. The radio isotope of _____ helps to increase the productivity of crops.

a) Sodium

b) Iron

c) Phosphorus

d) Iodine

12. If the radiation exposure is 100 R, it may cause _____.

a) Skin disease

b) Lung disease

c) Fatal disease

d) Heart disease

State true or false. If false, correct the statement:

1. Plutonium – 239 is a fissionable material.

2. Elements having atomic number greater than 83 can undergo nuclear fusion.

3. Nuclear fusion is more dangerous than nuclear fission.

4. Natural uranium U – 238 is the core fuel used in a nuclear reactor.

5. If a moderator is not present, then a nuclear reactor will behave as an atom bomb.

6. During one nuclear fission on an average, 2 to 3 neutrons are produced.

7. Einstein's theory of mass energy equivalence is used in nuclear fission and fusion.

Match the following:

Match: I

a. BARC - Kalpakkam

b. India's first atomic power station - Apsara

c. IGCAR - Mumbai

d. First nuclear reactor in India - Tarapur

Match: II

- a. Fuel - lead
- b. Moderate - heavy water
- c. Control rods - cadmium rods
- d. Shield - uranium

Match: III

- a. Soddy Fajan - Natural radioactivity
- b. Irene Curie - Displacement law
- c. Henry Bequerel - Mass energy equivalence
- d. Albert Einstein - Artificial Radioactivity

Match IV:

- a. Uncontrolled fission reaction - hydrogen bomb
- b. Fertile material - nuclear reactor
- c. Controlled fission reaction - breeder reactor
- d. Fusion reaction - atom bomb

Match: V

- a. Co – 60 - Age of fossil
- b. I – 131 - Function of heart
- c. Na – 24 - Leukemia
- d. C – 14 - Thyroid disease

Arrange the following in the correct sequence:**1. Arrange in descending order, on the basis of their penetration power:**

Alpha rays, beta rays, gamma rays, cosmic rays

2. Arrange the following in the chronological order of discovery:

Nuclear reactor, radioactivity, artificial radioactivity, discovery of radium

Complete the analogy:

- 1. Spontaneous process: Natural Radioactivity, Induced process: _____
- 2. Nuclear Fusion: Extreme temperature, Nuclear Fission: _____
- 3. Increasing crops: Radio phosphorus, Effective functioning of heart: _____
- 4. Deflected by electric field: α ray, Null Deflection: _____

Consider the statements given below and choose the correct option:

Mark the correct choice as:

- (a) If both assertion and reason are true and reason is the correct explanation of assertion
- (b) If both assertion and reason are true but reason is not the correct explanation of assertion
- (c) If assertion is true but reason is false
- (d) If assertion is false but reason is true

1. Assertion: A neutron impinging on U^{235} , splits it to produce Barium and Krypton.

Reason: U – 235 is a fissile material.

2. Assertion: In a β – decay, the neutron number decreases by one.

Reason: In β – decay atomic number increases by one.

3. Assertion: Extreme temperature is necessary to execute nuclear fusion.

Reason: In a nuclear fusion, the nuclei of the reactants combine releasing high energy.

4. Assertion: Control rods are known as 'neutron seeking rods'.

Reason: Control rods are used to perform sustained nuclear fission reaction.

Answers:

Choose the best answer:

1.a & c 2. All the above 3. Irene Curie 4. (ii) and (iii) are correct 5. Radio Cobalt it produces genetic disorders 7. Lead 8. (iii) and (iv) are correct 9. Nuclear Fusion 10. 4,8 11. Kalpakkam 12. (i) and (ii) are correct

Fill in the blanks:

1. 3.7×10^{10} 2. Anti particle of electron 3. Radio Iron 4. International Commission on Radiological Protection 5. Roentgen
6. Gamma rays 7. 10^0 8. Gamma decay 9. 3.84×10^{-12} 10. 10^7 to 10^9

True or False:

- 1. True
- 2. False (Elements having an atomic number greater than 83 can undergo nuclear fission not fusion)
- 3. False (Nuclear fission is more dangerous than nuclear fusion)
- 4. False (U-238 is not a fissile material Only fissile materials are used in the fuel of a nuclear reactor)
- 5. True
- 6. True
- 7. True

Match: I

- a) Mumbai
- b) Tarapur
- c) Kalpakkam
- d) Apsara

Match: II

- a) Uranium
- b) Graphite
- c) heavy water
- d) lead

Match: III

- a) Displacement law
- b) Artificial Radioactivity
- c) Natural radioactivity
- d) Mass energy equivalence

Match: IV

- a) Atom bomb
- b) Breeder reactor
- c) Nuclear Reactor
- d) Hydrogen Bomb

Match: III

- a) Leukemia
- b) Thyroid disease
- c) Function of Heart
- d) Age of fossil

Arrange the following in correct sequence:

1. Gamma rays, Beta rays, Alpha rays, Cosmic rays.
2. Radioactivity (1896), Discovery of radium (1898), Artificial radioactivity (1934), Nuclear reactor (1942).

Complete the analogy:

1. Artificial Radioactivity
2. Room Temperature
3. Radio Sodium
4. Gamma Ray

Reason and Assertion:

1. Both assertion and reason are true and reason is the correct explanation of assertion
2. Assertion is false but reason is true.
3. Both assertion and reason are true and reason is the correct explanation of assertion
4. Both assertion and reason are true and reason is the correct explanation of assertion

10th Science Lesson 7**7] Atoms And Melecules****Do You Know?**

Relative Atomic Mass is only a ratio, so it has no unit. If the atomic mass of an element expressed in grams, it is called as Gram Atomic Mass.

Gram Atomic Mass of hydrogen = 1 g

Gram Atomic Mass of carbon = 12 g

Gram Atomic Mass of nitrogen = 14 g

Gram Atomic Mass of oxygen = 16 g

Relative Molecular Mass is only a ratio. So, it has no unit. If the molecular mass of a compound is expressed in grams, it is called Gram Molecular Mass.

Gram Molecular Mass of water = 18 g

Gram Molecular Mass of carbon dioxide = 44 g

Gram Molecular Mass of ammonia = 17 g

Gram Molecular Mass of HCl = 36.5 g

Choose the best answers:

1. Which of the following has the smallest mass?

(a) 6.023×10^{23} atoms of He

(b) 1 atom of He

(c) 2 g of He

(d) 1 mole atoms of He

2. Which of the following is a triatomic molecule?

(a) Glucose

(b) Helium

(c) Carbon dioxide

(d) Hydrogen

3. The volume occupied by 4.4 g of CO_2 at S.T.P

(a) 22.4 litre

(b) 2.24litre

(c) 0.24litre

(d) 0.1litre

4. Mass of 1 mole of Nitrogen atom is

(a) 28 amu

(b) 14 amu

(c) 28 g

(d) 14 g

5. Which of the following represents 1 amu?

- (a) Mass of a C – 12 atom
- (b) Mass of a hydrogen atom
- (c) $1/12^{\text{th}}$ of the mass of a C – 12 atom
- (d) Mass of O – 16 atom

6. Which of the following statement is incorrect?

- (a) 12 gram of C – 12 contains Avogadro's number of atoms.
- (b) One mole of oxygen gas contains Avogadro's number of molecules.
- (c) One mole of hydrogen gas contains Avogadro's number of atoms.
- (d) One mole of electrons stands for 6.023×10^{23} electrons.

7. The volume occupied by 1 mole of a diatomic gas at S.T.P is

- (a) 11.2 litre
- (b) 5.6litre
- (c) 22.4litre
- (d) 44.8litre

8. In the nucleus of ${}_{20}\text{C}^{40}$, there are

- (a) 20 protons and 40 neutrons
- (b) 20 protons and 20 neutrons
- (c) 20 protons and 40 electrons
- (d) 40 protons and 200 electrons

9. The gram molecular mass of oxygen molecule is

- (a) 16 g
- (b) 18 g
- (c) 32 g
- (d) 17 g

10. 1 mole of any substance contains _____ molecules.

- (a) 6.023×10^{23}
- (b) 6.023×10^{-23}
- (c) 3.0115×10^{23}
- (d) 12.046×10^{23}

Fill in the blanks:

1. Atoms of different elements having _____ mass number, but _____ atomic numbers are called isobars.
 - a) Same, Same
 - b) Same, Different
 - c) Different, Different
 - d) Different, Same
2. Atoms of different elements having same number of _____ are called isotones.
 - a) Neutrons
 - b) Protons
 - c) Electrons
 - d) Positrons
3. Atoms of one element can be transmuted into atoms of other element by _____.
 - a) Artificial Transformation
 - b) Atomic Transmutation
 - c) Artificial Transmutation
 - d) Atomic Transformation
4. The sum of the numbers of protons and neutrons of an atom is called its _____.
 - a) Atomic Number
 - b) Mass Number
 - c) Protonic Number
 - d) None of the Above
5. Relative atomic mass is otherwise known as _____.
 - a) Standard atomic weight
 - b) Standard atomic number
 - c) Standard mass number
 - d) None of the above
6. The average atomic mass of hydrogen is _____ amu.
 - a) 1.005
 - b) 1.050
 - c) 1.008
 - d) 1.080
7. If a molecule is made of similar kind of atoms, then it is called _____ atomic molecule.
 - a) Bi
 - b) Tri
 - c) Quadra
 - d) Homo
8. The number of atoms present in a molecule is called its _____.
 - a) Atomicity

- b) Mass number
- c) Charge
- d) None of the above

9. One mole of any gas occupies _____ ml at S.T.P.

- a) 22200
- b) 22300
- c) 22400
- d) None of the above

10. Atomicity of phosphorous is _____

- a) One
- b) Two
- c) Three
- d) Four

Match the following:

- 1. 8 g of O_2 - 4 moles
- 2. 4 g of H_2 - 0.25 moles
- 3. 52 g of He - 2moles
- 4. 112 g of N_2 - 0.5moles
- 5. 35.5 g of Cl_2 - 13moles

State true or false. If false, correct the statement:

- 1. Two elements sometimes can form more than one compound.
- 2. Noble gases are Diatomic.
- 3. The gram atomic mass of an element has no unit.
- 4. 1 mole of Gold and Silver contain same number of atoms.
- 5. Molar mass of CO_2 is 42g.

Consider the statements given below and choose the correct option:

Answer the following questions using the data given below:

- i) A and R are correct, R explains the A.
- ii) A is correct, R is wrong.
- iii) A is wrong, R is correct
- iv) A and R are correct, R doesn't explain A.

1. Assertion: The Relative Atomic mass of aluminium is 27

Reason: An atom of aluminium is 27 times heavier than $1/12^{th}$ of the mass of the C – 12 atoms.

2. Assertion: The Relative Molecular Mass of Chlorine is 35.5 a.m.u.

Reason: The natural abundance of Chlorine isotopes is not equal.

Answers:

Choose the correct answers:

1.1 mole atoms of He 2. Carbon di oxide 3. 2.24 litre 4. 14g 5. $1/12^{\text{th}}$ of the mass of C-12 atom
6. One gram of C – 12 contains Avogadro's number of atoms 22.4 litres 8. 20 protons and neutrons 9. 16g 10. 6.023×10^{23}

Fill in the blanks:

1.same, different 2. Neutrons 3. artificial transmutation 4. mass number 5. standard atomic weight 6. 1.008 7. Homo
8. atomicity 9. 22400 10. Four

Match the following:

1. 0.25 moles 2. 2moles 3.13 moles 4. 4 moles 5. 0.5 moles

True or False:

- True
- False – Noble gases are Mono atomic.
- False – The unit of gram atomic mass of an element is gram.
- True
- False – Molar mass of CO_2 is 44 g.

Reason and Assertion:

- A is wrong, R is correct

10th Science Lesson 8

8] Periodic Classification Of Elements

Do You Know?

Noble gases show no tendency to accept electrons because the outer s and p orbitals of noble gases are completely filled. No more electrons can be added to them and hence their electron affinities are zero.

Extraction of metal from metal oxide can be categorized into three types:

More reactive metals	Medium reactive metals	Less reactive metals
Na, K, Ca, Mg, Al	Zn, Fe, Pb, Cu	Ag, Hg
Electrolytic reduction of metal oxide into metal	Chemical reduction of metal oxide into metal using coke	Thermal decomposition of metal oxide into metal

Dilute or concentrated nitric acid does not attack aluminium, but it renders aluminium passive due to the formation of an oxide film on its surface.

Choose the best answers:

1. The number of periods and groups in the periodic table are _____

(a) 6, 16

(b) 7, 17

(c) 8, 18

(d) 7, 18

2. The basis of modern periodic law is _____

(a) Atomic number

(b) Atomic mass

(c) Isotopic mass

(d) Number of neutrons

3. _____ group contains the member of halogen family.

(a) 17th

(b) 15th

(c) 18th

(d) 16th

4. _____ is a relative periodic property.

(a) Atomic radii

(b) Ionic radii

(c) Electron affinity

(d) Electronegativity

5. Chemical formula of rust is _____

(a) $\text{FeO} \cdot x\text{H}_2\text{O}$

(b) $\text{FeO}_4 \cdot x\text{H}_2\text{O}$

(c) $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$

(d) FeO

6. In the alumina thermic process the role of Al is _____

(a) Oxidizing agent

(b) Reducing agent

(c) Hydrogenating agent

(d) Sulphurising agent

7. The process of coating the surface of metal with a thin layer of zinc is called _____

(a) Painting

(b) Thinning

(c) Galvanization

(d) Electroplating

8. Which of the following have inert gases 2 electrons in the outermost shell?

(a) He

(b) Ne

(c) Ar

(d) Kr

9. Neon shows zero electron affinity due to _____

(a) Stable arrangement of neutrons

(b) Stable configuration of electrons

(c) Reduced size

(d) Increased density

10. _____ is an important metal to form amalgam.

(a) Ag

(b) Hg

(c) Mg

(d) Al

Fill in the blanks:

1. If the electronegativity difference between two bonded atoms in a molecule is greater than 1.7, the nature of bonding is _____

a) atomic

b) ionic

c) electronic

d) none of the above

2. _____ is the longest period in the periodical table.

a) 4th

b) 5th

c) 6th

d) 7th

3. _____ forms the basis of modern periodic table.

- a) Mass number
- b) Atomic number
- c) Avagardo's number
- d) None of the above

4. If the distance between two Cl atoms in Cl₂ molecule is 1.98 Å, then the radius of Cl atom is _____

- a) 0.96 Å
- b) 0.97 Å
- c) 0.98 Å
- d) 0.99 Å

5. Among the given species A⁻, A⁺, and A, the smallest one in size is _____

- a) A⁻
- b) A
- c) A⁺
- d) None of the above

6. The scientist who propounded the modern periodic law is _____

- a) Avagardo
- b) Dalton
- c) Dimitri Mendeleev
- d) None of the above

7. Across the period, ionic radii _____ (increased, decreases).

- a) Increases
- b) Decreases
- c) Remains the same
- d) None of the above

8. _____ and _____ are called inner transition elements.

- a) Lanthanides, Actinides
- b) Chalcogens, Halogens
- c) Alkalines, Alakalis
- d) None of the above

9. The chief ore of Aluminium is _____

- a) Ferrous
- b) Lithium
- c) Bauxite
- d) None of the above

10. The chemical name of rust is _____

- a) Ferric oxide
- b) Hydrated ferric oxide

- c) Hydrated Ferrous oxide
- d) None of the above

Match the following:

1. Galvanisation - noble gas elements
2. Calcination - coating with Zn
3. Redox reaction - silver-tin amalgam
4. Dental filling - alumina thermic process
5. Group 18 elements - heating in the absence of air

State true or false. If false, correct the statement:

1. Moseley's periodic table is based on atomic mass.
2. Ionic radius increases across the period from left to right.
3. All ores are minerals; but all minerals cannot be called as ores;
4. Al wires are used as electric cables due to their silvery white colour.
5. An alloy is a heterogenous mixture of metals.

Consider the statements given below and choose the correct option:**Answer the following questions using the data given below:**

- i) A and R are correct, R explains the A.
 - ii) A is correct, R is wrong.
 - iii) A is wrong, R is correct
 - iv) A and R are correct, R doesn't explain A.
1. Assertion: The nature of bond in HF molecule is ionic.
Reason: The electronegativity difference between H and F is 1.9.
 2. Assertion: Magnesium is used to protect steel from rusting.
Reason: Magnesium is more reactive than iron.
 3. Assertion: An uncleaned copper vessel is covered with greenish layer.
Reason: Copper is not attacked by alkali.

Answers:**Choose the best answer:**

1. 17th
2. Atomic number
3. $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$
4. Ionic Radii
5. Reducing agent
6. Galvanization
7. He
8. Stable configuration of electrons
9. Hg
- 10.

Fill in the blanks:

1. ionic 2. 6th (sixth) period 3. Atomic number 4. 0.99 Å 5. A⁺ 5. Dimitri Mendeleev 7. Decreases 8. Lanthanides, Actinides
9. bauxite 10. hydrated ferric oxide

Match the following:

1. coating with Zn 2. heating in the absence of air 3. alumina thermic process 4. silver-tin amalgam
5. noble gas elements

True or False:

1. False – Moseley's periodic table is based on atomic number.
2. True
3. True
4. False – Aluminium wires are used as electric cables because it is a good conductor of heat and electricity.
5. False – An alloy is a homogeneous mixture of metals.

Reason and Assertion:

1. A and R are correct, R explains the A
2. A and R are correct, R explains the A
3. A and R are correct, R doesn't explain A.

10th Science Lesson 9**9] Solutions****Do You Know?**

The effect of pressure on the solubility of a gas in liquid is given by Henry's law. It states that, the solubility of a gas in a liquid is directly proportional to the pressure of the gas over the solution at a definite temperature.

Choose the best answers:

1. A solution is a _____ mixture.
(a) Homogeneous
(b) Heterogeneous
(c) Homogeneous and heterogeneous
(d) Non homogeneous
2. The number of components in a binary solution is _____
(a) 2
(b) 3
(c) 4
(d) 5
3. Which of the following is the universal solvent?

(a) Acetone

(b) Benzene

(c) Water

(d) Alcohol

4. A solution in which no more solute can be dissolved in a definite amount of solvent at a given temperature is called _____

(a) Saturated solution

(b) Un saturated solution

(c) Super saturated solution

(d) Dilute solution

5. Identify the non aqueous solution.

(a) Sodium chloride in water

(b) Glucose in water

(c) Copper sulphate in water

(d) Sulphur in carbon – di – sulphate

6. When pressure is increased at constant temperature the solubility of gases in liquid _____

(a) No change

(b) Increases

(c) Decreases

(d) No reaction

7. Solubility of NaCl in 100 ml water is 36 g. If 25 g of salt is dissolved in 100 ml of water how much more salt is required for saturation _____

(a) 12 g

(b) 11 g

(c) 16 g

(d) 20 g

8. A 25% alcohol solution means

(a) 25 ml alcohol in 100 ml of water

(b) 25 ml alcohol in 25 ml water

(c) 25 ml alcohol in 75 ml of water

(d) 75 ml alcohol in 25 ml water

9. Deliquescence is due to _____

- (a) Strong affinity to water
- (b) Less affinity to water
- (c) Strong hatred to water
- (d) Inertness to water

10. Which of the following is hygroscopic in nature?

- (a) Ferric chloride
- (b) Copper sulphate penta hydrate
- (c) Silica gel
- (d) None of the above

Fill in the blanks:

1. The component present in lesser amount, in a solution is called _____

- a) solvent
- b) solute
- c) solution
- d) none of the above

2. Example for liquid in solid type solution is _____

- a) aqueous
- b) non aqueous
- c) amalgam
- d) none of the above

3. Solubility is the amount of solute dissolved in _____ g of solvent.

- a) 10
- b) 100
- c) 1000
- d) None of the above

4. Polar compounds are soluble in _____ solvents.

- a) Non polar
- b) Polar
- c) Bi polar
- d) None of the above

5. Volume percentage decreases with increases in temperature because _____

- a) Of expansion of gas
- b) Of contraction of gas
- c) Of expansion of liquid
- d) Of contraction of liquid

Match the following:

1. Blue vitriol - $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
2. Gypsum - CaO
3. Deliquescence - $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
4. Hygroscopic – NaOH

State true or false. If false, correct the statement:

1. Solutions which contain three components are called binary solution.
2. In a solution the component which is present in lesser amount is called solvent.
3. Sodium chloride dissolved in water forms a non-aqueous solution.
4. The molecular formula of green vitriol is $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$
5. When Silica gel is kept open, it absorbs moisture from the air, because it is hygroscopic in nature.

Answers:**Choose the best answer:**

1. Homogenous 2. 2 3. Water 4. Saturated Solution 5. Sulphur in Carbon di sulphide 6. Increases 7. 11g
8. 25 ml of alcohol in 75ml of water 9. Strong affinity to water 10. Silica gel

Fill in the blanks:

1. Solute 2. Amalgam 3. 100 4. Polar 5. of expansion of liquid

Match the following:

1. $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ 2. $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ 3. NaOH 4. CaO

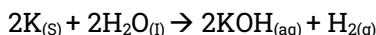
True or False:

1. False – Solutions which contain two components are called binary solution.
2. False – In a solution the component which is present in lesser amount is called solute.
3. False – Sodium chloride dissolved in water forms an aqueous solution.
4. False – The molecular formula of green vitriol is $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$
5. True

10th Science Lesson 10**10] Types Of Chemical Reactions****Do You Know?**

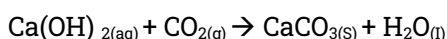
A balanced chemical equation is the simplified representation of a chemical reaction which describes the chemical composition, physical state of the reactants and the products and the reaction conditions.

The phases or the physical state of the substances in a chemical reaction are denoted in short form within a bracket, as the subscript of the formula, of the respective substances. For example, when solid potassium reacts with liquid water, it produces hydrogen gas and potassium hydroxide solution. All these information of the reaction is given in the chemical equation as shown below:



Symbol	Phase or physical state
S	Solid
L	Liquid
G	Gas
Aq	Aqueous Solution

A solution of slaked lime is used for white washing walls. Calcium hydroxide reacts slowly with the carbon dioxide in air to form a thin layer of calcium carbonate on the walls. Calcium carbonate is formed after two to three days of white washing and gives a shiny finish to the walls. It is interesting to note that the chemical formula for marble is also $CaCO_3$



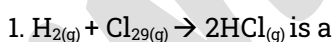
Slaked lime Carbon di oxide Calcium Carbonate Water

If hydrogen peroxide is poured on a wound, it decomposes into water and oxygen. The gaseous oxygen bubbles away as it is formed and thus prevent the formation of H_2O_2 .

Food kept at room temperature spoils faster than that kept in the refrigerator. In the refrigerator, the temperature is lower than the room temperature and hence the reaction rate is less.

Aerated soft drinks contain dissolved carbon dioxide in a pop bottle (Soda). When the bottle is sealed, the dissolved carbon dioxide (in the form of carbonic acid) and gaseous CO_2 are in equilibrium with each other. When you open the bottle, the gaseous CO_2 can escape. So, the dissolved CO_2 begins to undissolve back to the gas phase trying to replace the gas that was lost, when you opened the bottle. That's why if you leave it open long enough, it will go 'flat'. All the CO_2 will be gone, blown away in the air.

Choose the best answers:



- (a) Decomposition reaction
- (b) Combination reaction
- (c) Single Displacement reaction
- (d) Double Displacement reaction

2. Photolysis is a decomposition reaction caused by _____

- (a) Heat
- (b) Electricity

(c) Light

(d) Mechanical energy

3. A reaction between carbon and oxygen is represented by $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)} + \text{Heat}$. In which of the type(s), the above reaction can be classified?

(i) Combination reaction (ii) Combustion reaction

(iii) Decomposition reaction (iv) Irreversible reaction

(a) (i) and (ii)

(b) (i) and (iv)

(c) (i), (ii) and (iii)

(d) (i), (ii) and (iv)

4. The chemical equation $Na_2SO_{4(aq)} + BaCl_{2(aq)} \rightarrow BaSO_{4(s)} \downarrow + 2NaCl_{(aq)}$ represents which of the following types of reaction?

(a) Neutralization

(b) Combustion

(c) Precipitation

(d) Single displacement

5. Which of the following statements are correct about a chemical equilibrium?

(i) It is dynamic in nature

(ii) The rate of the forward and backward reactions is equal at equilibrium

(iii) Irreversible reactions do not attain chemical equilibrium

(iv) The concentration of reactants and products may be different

(a) (i), (ii) and (iii)

(b) (i), (ii) and (iv)

(c) (ii), (iii) and (iv)

(d) (i), (iii) and (iv)

6. A single displacement reaction is represented by $X_{(s)} + 2HCl_{(aq)} \rightarrow XCl_{2(aq)} + H_{2(g)}$. Which of the following(s) could be X.

(i) Zn (ii) Ag (iii) Cu (iv) Mg

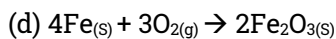
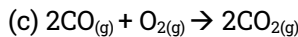
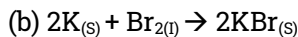
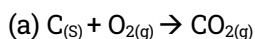
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(b) (ii) and (iii)

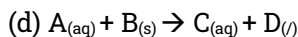
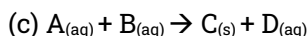
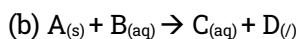
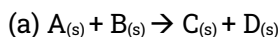
(c) (iii) and (iv)

(d) (i) and (iv)

7. Which of the following is not an “element + element → compound” type reaction?



8. Which of the following represents a precipitation reaction?



9. The pH of a solution is 3. Its $[OH^-]$ concentration is

(a) $1 \times 10^{-3} M$

(b) $3M$

(c) $1 \times 10^{-11} M$

(d) $11M$

10. Powdered $CaCO_3$ reacts more rapidly than flaky $CaCO_3$ because of _____

(a) Large surface area

(b) High pressure

(c) High concentration

(d) High temperature

Fill in the blanks:

1. A reaction between an acid and a base is called _____

a) Combination

b) Neutralization

c) Decomposition

d) None of the above

2. When lithium metal is placed in hydrochloric acid, _____ gas is evolved.

a) H_2

b) H_3

c) H_2O

d) None of the above

3. The equilibrium attained during the melting of ice is known as _____

- a) Chemical
b) Biological
c) Physical
d) None of the above
4. The pH of a fruit juice is 5.6. If you add slaked lime to this juice, its pH _____ (increase/decrease)
- a) Increase
b) Decrease
c) Remains the same
d) None of the above
5. The value of ionic product of water at 25°C is _____
- a) $1 \times 10^{-14} \text{ mol}^2 \text{ dm}^{-6}$
b) $1 \times 10^{-14} \text{ mol}^2 \text{ dm}^{-7}$
c) $1 \times 10^{-54} \text{ mol}^2 \text{ dm}^{-6}$
d) None of the above
6. The normal pH of human blood is _____
- a) 7.5
b) 7.6
c) 7.4
d) None of the above
7. Electrolysis is type of _____ reaction.
- a) Combination
b) Neutralization
c) Decomposition
d) None of the above
8. The number of products formed in a synthesis of reaction is _____
- a) 1
b) 2
c) 3
d) 4
9. Chemical volcano is an example for _____ type of reaction.
- a) Combination
b) Neutralization
c) Decomposition
d) None of the above
10. The ion formed by dissolution of H^+ in water is called _____
- a) Oxygen ion
b) Hydronium ion
c) Carbon ion
d) None of the above

Match the following:

1. Identify the types of reaction:

REACTION	TYPE
$\text{NH}_4\text{OH}_{(\text{aq})} + \text{CH}_3\text{COOH}_{(\text{aq})} \rightarrow \text{CH}_3\text{CHCOONH}_4_{(\text{aq})} + \text{H}_2\text{O}_{(\text{l})}$	Single Displacement
$\text{Zn}_{(\text{s})} + \text{CuSO}_4_{(\text{aq})} \rightarrow \text{ZnSO}_4_{(\text{aq})} + \text{Cu}_{(\text{s})}$	Combustion
$\text{ZnCO}_3_{(\text{s})} \xrightarrow{\text{Heat}} \text{ZnO}_{(\text{s})} + \text{CO}_2_{(\text{g})}$	Neutralisation
$\text{C}_2\text{H}_4_{(\text{g})} + 4\text{O}_2_{(\text{g})} \rightarrow 2\text{CO}_2_{(\text{g})} + 2\text{H}_2\text{O}_{(\text{g})} + \text{Heat}$	Thermal decomposition

State true or false. If false, correct the statement:

1. Silver metal can displace hydrogen gas from nitric acid.
2. The pH of rain water containing dissolved gases like SO_4 , CO_2 , NO_2 will be less than 7.
3. At the equilibrium of a reversible reaction, the concentration of the reactants and the products will be equal.
4. Periodic removal of one of the products of a reversible increases the yield.
5. On dipping a pH paper in a solution, it turns into yellow. Then the solution is basic.

Answers:

Choose the best answer:

1. Decomposition reaction
2. Light
3. (i), (ii) and (iv)
4. Precipitation
5. (i), (ii) and (iii)
6. (i) and (iv)
7. $2\text{CO}_{(\text{g})} + \text{O}_{2(\text{g})} \rightarrow 2\text{CO}_{2(\text{g})}$
8. $\text{A}_{(\text{aq})} + \text{B}_{(\text{aq})} \rightarrow \text{C}_{(\text{s})} + \text{D}_{(\text{aq})}$
9. $1 \times 10^{-11} \text{ M}$
10. large surface area

Fill in the blanks:

1. Neutralization
2. H_2
3. physical equilibrium
4. increases to '7'
5. $5.1 \times 10^{-14} \text{ mol}^2 \text{ dm}$
6. 7.4
7. Decomposition
8. 1
9. Decomposition
10. Hydronium ion

Match the following:

1. Neutralisation
2. Single Displacement
3. Thermal decomposition
4. Combustion

True or False:

1. False – Silver cannot displace H_2 from HNO_3 acid, since it is placed below hydrogen in the activity series.
2. True
3. False – At equilibrium the concentration of the reactants and products do not change it remains constant, but the concentration of the reactants and the products will not be equal.
4. True
5. False – The solution is neutral if the solution is basic it will be green in colour.

11] Carbon And Its Compounds

Do You Know?

Yeast and Fermentation: Yeasts are single – celled microorganisms, belonging to the class of fungi. The enzymes present in yeasts catalyse many complex organic reactions. Fermentation is conversion of complex organic molecules into simpler molecules by the action of enzymes. E.g. Curdling of milk.

Why ordinary soap is not suitable for using with hard water?

Ordinary soaps when treated with hard water, precipitate as salts of calcium and magnesium. They appear at the surface of the cloth as sticky grey scum. Thus, the soaps cannot be used conveniently in hard water.

Have you noticed the term “TFM” in soap: TFM means TOTAL FATTY MATTER. It is the one of the important factors to be considered to assess the quality of soap. A soap, which has higher TFM, is a good bathing soap.

Choose the best answers:

1. The molecular formula of an open chain organic compounds is C_3H_6 . The class of the compound is

- (a) Alkane
- (b) Alkene
- (c) Alkyne
- (d) Alcohol

2. The IUPAC name of an organic compound is 3-Methyl butan-1-ol. What type compound it is?

- (a) Aldehyde
- (b) Carboxylic acid
- (c) Ketone
- (d) Alcohol

3. The secondary suffix used in IUPAC nomenclature of an aldehyde is _____

- (a) -ol
- (b) -oic acid
- (c) -al
- (d) -one

4. Which of the following pairs can be the successive members of a homologous series?

- (a) C_3H_8 and C_4H_{10}
- (b) C_2H_2 and C_2H_4
- (c) CH_4 and C_3H_6
- (d) C_2H_5OH and C_4H_8OH

5. $\text{C}_2\text{H}_5\text{OH} + 3 \text{O}_2 \rightarrow 2 \text{CO}_2 + 3 \text{H}_2\text{O}$ is a

- (a) Reduction of ethanol
- (b) Combustion of ethanol
- (c) Oxidation of ethanoic acid
- (d) Oxidation of ethanol

6. Rectified spirit is an aqueous solution which contains about _____ of ethanol.

- (a) 95.5%
- (b) 75.5%
- (c) 55.5%
- (d) 45.5%

7. Which of the following are used as anaesthetics?

- (a) Carboxylic acids
- (b) Ethers
- (c) Esters
- (d) Aldehydes

8. TFM in soaps represents _____ content in soap.

- (a) Mineral
- (b) Vitamin
- (c) Fatty acid
- (d) Carbohydrate

9. Which of the following statements is wrong about detergents?

- (a) It is a sodium salt of long chain fatty acids
- (b) It is sodium salts of sulphonic acids
- (c) The ionic part in a detergent is $-\text{SO}_3^-\text{Na}^+$
- (d) It is effective even in hard water

Fill in the blanks:

1. An atom or a group of atoms which is responsible for chemical characteristics of an organic compound is called _____

- a. Nominal Group
- b. Functional Group
- c. Molecular Group
- d. All the above

2. The general molecular formula of alkynes is _____
- C_nH_{2n-2}
 - C_nH_{2n-1}
 - C_nH_{2n-3}
 - C_nH_{2n-4}
3. In IUPAC name, the carbon skeleton of a compound is represented by _____ (root word/prefix/suffix).
- Stem Word
 - Molecular Word
 - Cellular Word
 - Root Word
4. (Saturated/Unsaturated) _____ compounds decolourize bromine water.
5. Dehydration of ethanol by conc. Sulphuric acid forms _____ (ethane/ethene).
6. 100% pure ethanol is called _____
- Pure alcohol
 - Absolute alcohol
 - Pure ethanol
 - Absolute ethanol
7. Ethanoic acid turns _____ litmus to _____
- Red, blue
 - Red, Colourless
 - Blue, Red
 - Blue, Colourless
8. The alkaline hydrolysis of fatty acids is termed as _____
- Saponification
 - Alkalysis
 - Hydronification
 - None of the above
9. Biodegradable detergents are made of _____ (branched/straight) chain hydrocarbons.

Match the following:

- Functional group –OH - Benzene
- Heterocyclic - Potassium stearate
- Unsaturated - Alcohol
- Soap - Furan
- Carbocyclic – Ethene

Consider the statements given below and choose the correct option:

Answer the following questions using the data given below:

i) A and R are correct, R explains the A.

ii) A is correct, R is wrong.

iii) A is wrong, R is correct

iv) A and R are correct, R doesn't explain A.

1. Assertion: Detergents are more effective cleansing agents than soaps in hard water.

Reason: Calcium and magnesium salts of detergents are water soluble.

2. Assertion: Alkanes are saturated hydrocarbons.

Reason: Hydrocarbons consist of covalent bonds.

Answers:

Choose the best answer:

1. Alkene 2. Alcohol 3. -al 4. C_3H_8 and C_4H_{10} 5. Combustion of ethanol 6. 95.5% 7. Ethers 8. Fatty Acid
9. It is a sodium salt of long chain fatty acids.

Fill in the blanks:

1. Functional group
2. C_nH_{2n-2}
3. root word
4. Unsaturated
5. Ethane
6. absolute alcohol
7. Blue, red
8. Saponification
9. straight

Match the following:

1. Alcohol 2. Furan 3. Ethene 4. Potassium stearate 5. Benzene

True or False:

1. A and R are correct, R explains the A.
2. A and R are correct, R doesn't explain A.

10th Science Lesson 12

12] Plant Anatomy And Plant Physiology

Do You Know?

ATP	Adenosine Triphosphate
ADP	Adenosine Diphosphate
NAD	Nicotinamide Adenine Dinucleotide

NADP	Nicotinamide Adenine Dinucleotide Phosphate
------	---

A cell cannot get its energy directly from glucose. So in respiration the energy released from glucose is used to make ATP (Adenosine Triphosphate).

Melvin Calvin, an American biochemist, discovered chemical pathway for photosynthesis. The cycle is named as Calvin cycle. He was awarded with Nobel Prize in the year 1961 for his discovery.

Artificial photosynthesis is a method for producing renewable energy by the use of sunlight. Indian scientist C.N.R. Rao who was conferred the Bharat Ratna (2013) is also working on similar technology of artificial photosynthesis to produce – Hydrogen fuel (renewable energy).

Choose the best answers:

1. Casparianstrips are present in the _____ of the root.

- (a) Cortex
- (b) Pith
- (c) Pericycle
- (d) Endodermis

2. The endarch condition is the characteristic feature of

- (a) Root
- (b) Stem
- (c) Leaves
- (d) Flower

3. The xylem and phloem arranged side by side on same radius is called _____

- (a) Radial
- (b) Amphivasal
- (c) Conjoint
- (d) None of these

4. Which is formed during anaerobic respiration

- (a) Carbohydrate
- (b) Ethyle alcohol
- (c) Acetyl CoA
- (d) Pyruvate

5. Kreb's cycle takes place in

- (a) Chloroplast

(b) Mitochondrial matrix

(c) Stomata

(d) Inner mitochondrial membrane

6. Oxygen is produced at what point during photosynthesis?

(a) When ATP is converted to ADP

(b) When CO_2 is fixed

(c) When H_2O is splitted

(d) All of these

Fill in the blanks:

1. The innermost layer of cortex in root is called _____

- a. endodermis and pericycle
- b. epidermis and pericycle
- c. pith and pericycle
- d. None of the above

2. Xylem and phloem are arranged in an alternate radii constitute a vascular bundle called _____

- a. Conjoint bundles
- b. Co-joint bundles
- c. Bi- joint bundles
- d. None of the above

3. Glycolysis takes place in _____

- a. Mitochondria
- b. Stroma
- c. Cytoplasm
- d. Grana

4. The source of O_2 liberated in photosynthesis is _____

- a. Splitting of CO_2
- b. Splitting of Water Molecules
- c. Splitting of Cells
- d. None of the above

5. _____ is ATP factory of the cells.

- a. Mitochondria
- b. Stroma
- c. Cytoplasm
- d. Grana

State true or false. If false, correct the statement:

1. Phloem tissue is involved in the transport of water in plant.

2. The waxy protective covering of a plant is called as cuticle.
3. In monocot stem cambium is present in between xylem and phloem.
4. Palisade parenchyma cells occur below upper epidermis in dicot root.
5. Mesophyll contains chlorophyll.
6. Anaerobic respiration produces more ATP than aerobic respiration.

Match the following:

1. Amphicribal - Dracaena
2. Cambium - Translocation of food
3. Amphivasal - Fern
4. Xylem - Secondary growth
5. Phloem - Conduction of water

Answers:**Choose the best answer:**

1. Endodermis 2. Stem 3. Conjoint 4. Ethyl Alcohol 5. Mitochondrial matrix 6. All of these

Fill in the blanks:

1. Epidermis and Pericycle 2. Conjoint bundles 3. Cytoplasm 4. splitting of Water molecules 5. Mitochondria

True or False:

1. False – Phloem tissue is involved in the transport of food in plants.
2. True
3. False – In monocot stem cambium is absent.
4. True
5. True
6. False – Aerobic respiration produces more ATP than anaerobic respiration.

Match the following:

1. Fern 2. Secondary growth 3. Dracaena 4. Conduction of water 5. Translocation of food

13] Structural Organisation Of Animals

Do You Know?

Leeches do not have ear, hence can sense vibrations through their skin. Leeches have 2 to 10 tiny eyes, which helps them to locate their food. Leeches can suck blood five times more than their body weight. It may take more than a year for the complete digestion and absorption of a full meal.

Blood letting is a technique of bleeding in a patient to remove toxic impurities from the body.

Medical value of Leech: Leeches are effective in increasing blood circulation and breaking up blood clots. It is surprising that they can be used to treat cardiovascular diseases. Biochemical substances derived from leech saliva are used for preparation of pharmaceutical drugs that can treat hypertension.

The pygmy rabbit was listed as a threatened species in Washington in 1990, because of decline in its population size and distribution due to habitat loss. In March 2003, the Columbia Basin Pygmy Rabbit was federally listed as an endangered species.

Choose the best answers:

1. In leech locomotion is performed by

- (a) Anterior sucker
- (b) Parapodia
- (c) Setae
- (d) Contraction and relaxation of muscles

2. The segments of leech are known as

- (a) Metameres (somites)
- (b) Proglottids
- (c) Strobila
- (d) All the above

3. Pharyngeal ganglion in leech is a part of

- (a) Excretory system
- (b) Nervous system
- (c) Reproductive system
- (d) Respiratory system

4. The brain of leech lies above the

- (a) Mouth
- (b) Buccal Cavity
- (c) Pharynx

(d) Crop

5. The body of leech has

(a) 23 segments

(b) 33 segments

(c) 38 segments

(d) 30 segments

6. Mammals are _____ animals.

(a) Cold blooded

(b) Warm blooded

(c) Poikilothermic

(d) All the above

7. The animals which give birth to young ones are

(a) Oviparous

(b) Viviparous

(c) Ovoviviparous

(d) All the above

Fill in the blanks:

1. The posterior sucker is formed by the fusion of the _____ segments.

a. Last seven

b. First seven

c. First nine

d. Last nine

2. The existence of two sets of teeth in the life of an animal is called _____ dentition.

a. Monodont

b. Diphyodont

c. Triodont

d. None of the above

3. The anterior end of leech has a lobe-like structure called _____

a. Mouth

b. Anus

c. Sucker

d. None of the above

4. The blood sucking habit of leech is known as _____.

a. Carnivorous

- b. Sanguivorous
c. Herbivorous
d. None of the above
5. _____ separate nitrogenous waste from the blood in rabbit.
- a. Nephrons
b. Neurons
c. Pleura
d. None of the above
6. _____ spinal nerves are present in rabbit.
- a. 34 pairs
b. 35 pairs
c. 36 pairs
d. 37 pairs

State true or false. If false, correct the statement:

1. An anticoagulant present in saliva of leech is called heparin.
2. The vas deferens serves to transport the ovum.
3. Diastema is a gap between premolar and molar teeth in rabbit.
4. The cerebral hemispheres of rabbit are connected by band of nerve tissue called corpora quadrigemina.

Match columns I, II and III correctly:

Organs	Membranous Covering	Location
Brain	Pleura	Abdominal cavity
Kidney	Capsule	Mediastinum
Heart	Meninges	Enclosed in thoracic cavity
Lungs	Pericardium	Cranial cavity

Answers:**Choose the best answers:**

1. None of the above 2. Metameres (somites) 3. Nervous System 4. Pharynx 5. 33 Segments 6. Warm blooded 7. Viviparus

Fill in the blanks:

1. Last seven 2. Diphyodont 3. Sucker 4. Sanguivorous 5. Nephrons 6. 37 pairs

True or False:

1. False - The anticoagulant present in the saliva of the leech is called Hirudin.
2. False - The vas deferens serves to transport the sperm.
3. False - The rabbit has a third eyelid called Nictitating membrane, which is movable.

4. True -

5. False - The cerebral hemisphere of the rabbit is connected by a band of nerve tissue called Corpus callosum.

Match the following:

Organs	Membranous Covering	Location
Brain	Meninges	Cranial cavity
Kidney	Capsule	Abdominal cavity
Heart	Pericardium	Enclosed in thoracic cavity
Lungs	Pleura	mediastinum

10th Science Lesson 14**14] Transportation In Plants And Circulation In Animals****Do You Know?**

Dews like water droplets on the leaves of grass seen in the early mornings, when the climate is humid and excess of water is present in the plants, the excess water is exudated in the form of liquid. This is due to root pressure. This phenomenon is called Guttation which takes place through specialized cells called Hydathodes.

Why does mammalian RBC lack cell organelles and nucleus? Mammalian RBC lack nucleus and makes the cells biconcave and increase surface area for oxygen binding, loss of mitochondria allows the RBC to transport all the oxygen to tissues, and loss of endoplasmic reticulum allows more flexibility for RBC to move through the narrow capillaries.

Anaemia: Decrease in number of erythrocytes.

Leucocytosis: Increase in the number of leukocytes.

Leukopenia: Decrease in the number of leukocytes.

Thrombocytopenia: Decreases in the number of thrombocytes.

Closed circulatory system was discovered by William Harvey (1628) who is regarded the Father of Modern Physiology.

Heart chambers in vertebrate animals:

Two chambered: Fishes

Three chambered: Amphibians

Incomplete four chambered: Reptiles

Four chambered: Aves, Mammals and Crocodiles (Reptile)

Neurogenic and Myogenic Heart Beat: Neurogenic heart beat is initiated by a nerve impulse caused from a nerve ganglion situated near the heart. E.g. Annelids, most arthropods; Myogenic heart beat is initiated by a specialized group of modified heart muscle fibres. E.g. Mollusca and Vertebrates

Atrioventricular bundle was discovered by His (1893). So is called Bundle of His.

Choose the best answers:

1. Active transport involves
 - (a) Movement of molecules from lower to higher concentration
 - (b) Expenditure of energy
 - (c) It is an uphill task
 - (d) All of the above
2. Water which is absorbed by roots is transported to aerial parts of the plant through
 - (a) Cortex
 - (b) Epidermis
 - (c) Phloem
 - (d) Xylem
3. During transpiration there is loss of
 - (a) Carbon dioxide
 - (b) Oxygen
 - (c) Water
 - (d) None of the above
4. Root hairs are
 - (a) Cortical cell
 - (b) projection of epidermal cell
 - (c) Unicellular
 - (d) Both b and c
5. Which of the following process requires energy?
 - (a) Active transport
 - (b) Diffusion
 - (c) Osmosis
 - (d) All of them
6. The wall of human heart is made of
 - (a) Endocardium
 - (b) Epicardium
 - (c) Myocardium

(d) All of the above

7. Which is the correct sequence of blood flow

(a) Ventricle → atrium → vein → arteries

(b) atrium → ventricle → veins → arteries

(c) Atrium → ventricle → arteries → vein

(d) Ventricles → vein → atrium → arteries

8. A patient with blood group O was injured in an accident and has blood loss. Which group of blood should be used by doctor for transfusion?

(a) O group

(b) AB group

(c) A or B group

(d) all blood groups

9. 'Hear of heart' is called

(a) SA node

(b) AV node

(c) Purkinje fibres

(d) Bundle of Hits

10. Which one of the following shows correct composition of blood

(a) Plasma – Blood + Lymphocyte

(b) Serum- Blood + Fibrinogen

(c) Lymph – Plasma + RBC + WBC

(d) Blood – Plasma + RBC + WBC + Platelets

Fill in the blanks:

1. _____ involves evaporation loss of water from aerial parts.

a. Transportation

b. Transmigration

c. Transpiration

d. None of the above

2. Water enters into the root hair cell through _____ plasma membrane.

a. Osmosis

b. Reverse osmosis

c. Capillary

d. None of the above

3. Part of the root that absorbs water from the soil is _____.

- a. Root nodules
- b. Root hairs
- c. Root cells
- d. None of the above

4. Normal blood pressure is _____

- a. 120mm/80mm Hg
- b. 120mm/90mm Hg
- c. 130mm/80mm Hg
- d. 130mm/90mm Hg

5. The normal human heartbeat rate is about _____ timer per minute.

- a. 72-75
- b. 75-78
- c. 76- 79
- d. 79-82

Match the following:

Section I

- 1. Symplastic pathway - Leaf
- 2. Transpiration - Plasmodesmata
- 3. Osmosis - Pressure in xylem
- 4. Root Pressure - Pressure gradient

Section II

- 1. Leukemia - Thrombocytes
- 2. Platelets - Phagocyte
- 3. Monocytes - Decrease in leucocytes
- 4. Leucopenia - Blood Cancer
- 5. AB blood group - Allergic condition
- 6. O blood group – Inflammation
- 7. Eosinophil - Absence of antigen
- 8. Neutrophils - Absence of antibody

State true or false. If false, correct the statement:

- 1. The phloem is responsible for the translocation of food.
- 2. Plants lose water by the process of transpiration.
- 3. The form of sugar transported through the phloem is glucose.

4. In apoplastic movement the water travels through the cell membrane and enter the cell.
5. When guard cells lose water the stoma opens.
6. Initiation and stimulation of heart beat take place by nerves.
7. All veins carry deoxygenated blood.
8. WBC defend the body from bacterial and viral infections.
9. The closure of the mitral and tricuspid valves at the start of the ventricular systole produces the first sound 'LUBB'.

Answers:**Choose the best answers:**

1. Movement of molecules from lower to higher concentration 2. Xylem 3. Water 4. Both (b) and (c) 5. Active transport
6. All the above 7. atrium – ventricle – arteries – vein 8. O group 9. SA node 10. Blood – Plasma + RBC + WBC + Platelets

Fill in the blanks:

1. Transpiration 2. Osmosis 3. Root hairs 4. 120mm/80 mm Hg 5. 72-75

Match the following:**Section I**

1. Plasmodesmata 2. Leaf 3. Pressure gradient
4. Pressure in xylem

Section II

1. Blood Cancer 2. Thrombocytes 3. Phagocyte 4. Decrease in leucocytes 5. Absence of antibody 6. Absence of antigen 7. Allergic condition 8. Inflammation

State true or false. If false, correct the statement:

1. True
2. True
3. False - The form of sugar transported through the phloem is sucrose.
4. False - In apoplastic movement the water travels through the inter-cellular spaces and walls of the cells.
5. False - When guard cells become turgid the stoma opens.
6. False - Initiation and stimulation of heart beat take place by muscles.
7. False - All veins carry deoxygenated blood except pulmonary vein which carries oxygenated blood.
8. True

10th Science Lesson 15

15] Nervous System

Do You Know?

Each neuron can transmit 1,000 nerve impulses per second and make as many as ten thousands of synaptic contacts with other neurons.

Meningitis is an inflammation of the meninges. It can occur when fluid surrounding the meninges becomes infected. The most common causes of meningitis are viral and bacterial infections.

The human brain constitutes nearly 60 percent of fat. The most crucial molecules that determine our brain's integrity and the ability are Essential Fatty Acids (EFAs). EFAs cannot be synthesised and must be obtained from food. Fish, green leafy vegetables, almond, walnut are rich sources of EFAs.

Electroencephalogram (EEG) is an instrument which records the electrical impulses of brain. An EEG can detect abnormalities in the brain waves and help in diagnoses of seizures, epilepsy, brain tumors, head injuries, etc.

Choose the best answers:

1. Bipolar neurons are found in

- (a) Retina of eye
- (b) Cerebral cortex
- (c) Embryo
- (d) Respiratory epithelium

2. Site for processing of vision, hearing, memory, speech, intelligence and thought is

- (a) Kidney
- (b) Ear
- (c) Brain
- (d) Lungs

3. In reflex action, the reflex arc is formed by

- (a) Brain, spinal cord, muscle
- (b) Receptor, muscle, spinal cord
- (c) Muscle, receptor, brain
- (d) Receptor, spinal cord, muscle

4. Dendrites transmit impulse _____ cell body and axon transmit impulse _____ cell body.

- (a) Away from, away from
- (b) Towards, away from

(c) Towards, towards

(d) Away from, towards

5. The outer most of the three cranial meninges is

(a) Arachnoid membrane

(b) Piameter

(c) Durameter

(d) Myelin sheath

6. There are _____ pairs of cranial nerves and _____ pairs of spinal nerves.

(a) 12, 31

(b) 31, 12

(c) 12, 13

(d) 12, 21

7. The nervous which carries impulse from the central nervous system to the muscle fibre.

(a) Afferent neurons

(b) Association neurons

(c) Efferent neuron

(d) Unipolar neuron

8. Which nervous band connects the two cerebral hemispheres of brain?

(a) Thalamus

(b) Hypothalamus

(c) Corpus callosum

(d) Pons

9. Node of Ranvier is found in

(a) Muscles

(b) Axons

(c) Dendrites

(d) Cyton

10. Vomiting centre is located in

(a) Medulla oblongata

(b) Stomach

(c) Cerebrum

(d) Hypothalamus

11. Nerve cells do not possess

(a) Neurilemma

(b) Sarcolemma

(c) Axon

(d) Dendrites

12. A person who met with an accident lost control of body temperature, water balance, and hunger. Which of the following part of brain is supposed to be damaged?

(a) Medulla oblongata

(b) Cerebrum

(c) Pons

(d) Hypothalamus

Fill in the blanks:

1. _____ is the longest cell in our body.

a. Axon

b. Neuron

c. RBC

d. None of the above

2. Impulses travels rapidly in _____ neurons.

a. Sheath

b. Myelin Sheath

c. Axon

d. None of the above

3. A change in the environment that causes an animal to react is called _____

a. Action

b. Hibernation

c. Reaction or response

d. None of the above

4. _____ carries the impulse towards the cell body.

a. Axon

b. Myelin Sheath

c. Dendrites

d. None of the above

5. The two antagonistic component of autonomic nervous system are _____ and _____

- a. Sympathetic, asympathetic
 - b. Sympathetic, Parasympathetic
 - c. Sympathetic, Sympathetic
 - d. None of the above
6. A neuron contains all cell organelles except _____
- a. Golgi apparatus
 - b. Axon
 - c. Myelin Sheath
 - d. None of the above
7. _____ maintains the constant pressure inside the cranium.
- a. Spinal fluid
 - b. Plasma fluid
 - c. Cerebrospinal fluid
 - d. None of the above
8. _____ and _____ increases the surface area of cerebrum.
- a. Gyri and sulci
 - b. Golgi apparatus
 - c. Myelin and sheath
 - d. None of the above
9. The part of human brain which acts as relay centre is _____
- a. Hypo thalamus
 - b. Hyper thalamus
 - c. Thalamus
 - d. None of the above

State true or false. If false, correct the statement:

1. Dendrons are the longest fibres that conducts impulses away from the cell body.
2. Sympathetic nervous system is a part of central nervous system.
3. Hypothalamus is the thermoregulatory centre of human body.
4. Cerebrum controls the voluntary actions of our body.
5. In the central nervous system myelinated fibres form the white matter.
6. All the nerves in the body are covered and protected by meninges.
7. Cerebrospinal fluid provides nutrition to brain.
8. Reflex arc allows the rapid response of the body to a stimulus.
9. Pons helps in regulating respiration.

Match the following:

Column I - Column II

1. Nissil's granules - Forebrain
2. Hypothalamus - Peripheral nervous system
3. Cerebellum - Cyton
4. Schwann cell - Hindbrain

Consider the statements given below and choose the correct option:

- (a) Assertion is correct and reason is wrong
- (b) Reason is correct and the assertion is wrong
- (c) Both assertion and reason are correct
- (d) Both assertion and reason are wrong

1. Assertion: Cerebrospinal fluid is present throughout the central nervous system.

Reason: Cerebrospinal fluid has no such functions.

2. Assertion: Corpus callosum is present in space between the duramater and piameter.

Reason: It serves to maintain the constant intracranial pressure.

Answers:

Choose the correct answers:

1. Retina of the eye 2. Brain 3. Receptor, Muscle, Spinal chord 4. Towards, away from 5. Durameter 6. 12,31 7. Efferent neuron
8. corpus callosum 9. Axons 10. medulla oblongata 11. Sarcolemma 12. Hypothalamus

Fill in the blanks:

1. Axon 2. Myelin Sheath of 3. Reaction or responses 4. Dendrites 5. Sympathetic, Parasympathetic 6. Golgi apparatus in axon 7. Cerebrospinal fluid 8. Gyri and Sulci 9. Thalamus

True or False:

1. False - Axons are the longest fibres that conduct impulses away from the cell body.
2. False - Sympathetic nervous system is a part of the autonomic nervous system.
3. True
4. True
5. False - In the central nervous system, two types of matter such as white matter or grey matter, is formed, with respect to the presence or absence of myelin sheath.
6. False - The brain is covered by three connective tissue membrane or meninges.
7. True
8. True
9. True

Match the following:

1. Cyton 2. Forebrain 3. Hind brain 4. Peripheral Nervous system

Reason and assertion:

1. Assertion is correct and reason is wrong
2. Both assertion and reason are wrong

10th Science Lesson 16

16] Plant And Animal Hormones

Do You Know?

Phenyl Acetic Acid (PAA) and Indole 3 Acetonitrile (IAN) are natural auxins. Indole 3 Butyric Acid (IBA), Indole-3-Propionic Acid, α -Naphthalene Acetic Acid (NAA), 2, 4, 5-T (2, 4, 5 Trichlorophenoxy Acetic Acid) are some of the synthetic auxins.

The branch of biology which deals with the study of the endocrine glands and its physiology is known as 'Endocrinology'. Thomas Addison is known as Father of Endocrinology. English physiologist W.M. Bayliss and E.H. Starling introduced the term hormone in 1909. They first discovered the hormone secretin.

Melatonin is a hormone produced by the pineal gland. It is known as a 'time messenger'. It signals night time information throughout the body.

Exposure to light at night, especially short-wavelength light, can decrease melatonin production interrupting sleep. Suppression of melatonin has been implicated in sleep disturbances and related metabolic disorders.

Edward C. Kendal in 1914 first crystallised thyroxine hormone. Charles Harrington and George Barger identified the molecular structure of thyroxine in 1927. Thyroid gland requires "120 μg " of iodine everyday for the production of thyroxine.

Human insulin was first discovered by Fredrick Banting, Charles Best and MacLeod in 1921. Insulin was first used in treatment of diabetes on 11th January 1922.

The cortisol hormones of adrenal cortex serve to maintain the body in living condition and recover it from the severe effects of stress reactions. Thus an increased output of cortisol is "life saving" in "shock conditions". It is also known as life-saving hormone.

Choose the best answers:

1. Gibberellins cause:

- (a) Shortening of genetically tall plants
- (b) Elongation of dwarf plants
- (c) Promotion of rooting
- (d) Yellowing of young leaves

2. The hormone which has positive effect on apical dominance is:

- (a) Cytokinin
- (b) Auxin
- (c) Gibberellins
- (d) Ethylene

3. Which one of the following hormones is naturally not found in plants?

- (a) 2, 4-D
- (b) GA3
- (c) Gibberellins
- (d) IAA

4. Avena coleoptile test was conducted by

- (a) Darwin
- (b) N. Smit
- (c) Paal
- (d) F.W. Went

5. To increase the sugar production in sugarcane they are sprayed with _____

- (a) Auxin
- (b) Cytokinin
- (c) Gibberellins
- (d) Ethylene

6. LH is secreted by

- (a) Adrenal gland
- (b) Thyroid gland
- (c) Anterior pituitary
- (d) Hypothalamus

7. Identify the exocrine gland

- (a) Pituitary gland
- (b) Adrenal gland
- (c) Salivary gland
- (d) Thyroid gland

8. Which organ acts as both exocrine gland as well as endocrine gland?

- (a) Pancreas
- (b) Kidney
- (c) Liver
- (d) Lungs

9. Which one is referred as "Master Gland"?

- (a) Pineal gland
- (b) Pituitary gland
- (c) Thyroidgland
- (d) Adrenalgland

Fill in the blanks:

1. _____ causes cell elongation, apical dominance and prevents abscission.

- a. Auxin
- b. Ethylene
- c. Absciscic acid
- d. None of the above

2. _____ is a gaseous hormone involved in abscission of organs and acceleration of fruit ripening.

- a. Auxin
- b. Ethylene
- c. Absciscic acid
- d. None of the above

3. _____ causes stomatal closure.

- a. Auxin
- b. Ethylene
- c. Absciscic acid
- d. None of the above

4. Gibberellins induce stem elongation in _____ plants.

- a. Pea and chickpea
- b. Pea and corn
- c. Pea and maize
- d. None of the above

5. The hormone which has negative effect on apical dominance is _____

- a. Auxin
- b. Ethylene
- c. Absciscic acid
- d. Cytokinin

6. Calcium metabolism of the body is controlled by _____

- a. Parthormone
- b. Auxin
- c. Thormone
- d. None of the above

7. In the islets of Langerhans, beta cells secrete _____

- a. Parthormone
- b. Auxin
- c. Thormone
- d. Insulin

8. The growth and functions of thyroid gland is controlled by _____

- a. Hormone T_5 and T_6
- b. Hormone T_3 and T_4
- c. Hormone T_2 and T_3
- d. Hormone T_1 and T_6

9. Decreased secretion of thyroid hormones in the children leads to _____

- a. Azar Azar
- b. Cretinism
- c. Marasmus
- d. None of the above

Match Column I with Columns II and III:

Column I	Column II	Column III
Auxin	Gibberellafujikuroi	Abscission
Ethylene	Coconut milk	Intermodal elongation
Absciscic acid	Coleoptiles tip	Apical dominance
Cytokinin	Chloroplast	Ripening
Gibberellins	Fruits	Cell division

Match the following hormones with their deficiency states:

Hormones - Disorders

- (a) Thyroxine - Acromegaly
- (b) Insulin - Tetany
- (c) Parathormone - Simple goitre
- (d) Growth hormone - Diabetes insipidus
- (e) ADH - Diabetes mellitus

State true or false. If false, correct the statement:

1. A plant hormone concerned with stimulation of cell division and promotion of nutrient mobilization is cytokinin.
2. Gibberellins cause parthenocarpy in tomato.
3. Ethylene retards senescence of leaves, flowers and fruits.

4. Exophthalmic goiter is due to the over secretion of thyroxine.
5. Pituitary gland is divided into four lobes.
6. Estrogen is secreted by corpus luteum.

Consider the statements given below and choose the correct option:

Direction: In each of the following questions a statement of assertion (A) is given and a corresponding statement of reason (R) is given just below it. Mark the correct statement as.

- (a) If both A and R are true and R is correct explanation of A
- (b) If both A and R are true but R is not the correct explanation of A
- (c) A is true but R is false
- (d) Both A and R are false

1. Assertion: Application of cytokinin to marketed vegetables can keep them fresh for several days.

Reason: Cytokinins delay senescence of leaves and other organs by mobilisation of nutrients.

2. Assertion (A) : Pituitary gland is referred as "Master gland".

Reason (R) : It controls the functioning of other endocrine glands.

3. Assertion (A) : Diabetes mellitus increases the blood sugar levels.

Reason (R) : Insulin decreases the blood sugar levels.

Answers:

Choose the best option:

1. Promotion of rooting 2. Auxin 3. 2,4-D 4. F.W. Went 5. Ethylene 6. Anterior pituitary 7. Salivary gland 8. Pancreas 9. Pituitary gland

Fill in the blanks:

1. Auxin 2. Ethylene 3. Abscissic Acid 4. Corn and pea 5. Cytokinin 6. Parathormone 7. Insulin 8. Hormone T3 and T4 9. Cretinism

Match the following:

(a)

Auxin	Coleoptile tip	Apical dominance
Ethylene	Fruits	Ripening
Abciscic acid	Chloroplast	Abcission
Cytokinin	Coconut milk	Cell division
Gibberellins	Gibberella fujikuroi	Intermodal elongation

(b)

1. Simple goitre
2. Diabetes mellitus
3. Tetany
4. Acromegaly
5. Diabetes insipidus

True or False:

1. True
2. True
3. False - Ethylene hastens the senescence of leaves, flowers and fruits.
4. True
5. False - The Pituitary gland is composed of two lobes and performs different functions.
6. False - Estrogen is produced by the Graafian follicles of the ovary.

Reason and Assertion:

1. Both A and R are true and R is correct explanation of A
2. Both A and R are false
3. Both A and R are true and R is correct explanation of A

10th Science Lesson 17**17] Reproduction In Plants And Animals****Do You Know?**

The number of primordial follicles in new born female child ranges over 7 million and during reproductive period (at puberty) the number is around 60,000 to 70,000. During a woman's lifetime, she will only ovulate 300 to 400 of the 1 – 2 million eggs, she was initially born with. On the other side, men will produce over 500 billion sperms in their lifetime.

Menstruation is a periodical phenomenon that continues from puberty to menopause, this will happen if the released ovum is not fertilized by the sperm. Lack of menstruation generally indicates pregnancy.

Normally one egg matures in the ovary each month. Ovulation is the rupture of the follicle releasing the egg or ovum. The uterus prepares itself to receive the fertilized egg every month. The uterine lining becomes thick and spongy for implantation of the fertilized egg.

Events leading to when fertilization occurs and does not occur: If fertilization takes place the corpus luteum persists, continues to secrete progesterone maintains the thickened state of uterine wall and prevents maturation of another follicle till the end of pregnancy. If fertilization does not occur, corpus luteum degenerates, the egg disintegrates and the uterine lining slowly breaks, discharged as blood and mucus leading to menstrual events.

The milk produced from the breast during the first 2 to 3 days after child birth is called colostrums. It contains immune substances and provides immunity to the new born which is essential for the body.

Sometimes ovaries release two eggs and each is fertilized by a different sperm, resulting in Non-Identical Twins (Fraternal Twins). If single egg is fertilized and then divides into two foetus, Identical Twins develop.

The inverted red triangle is a symbol of family planning in India for family welfare. It is displayed prominently at all hospitals, primary health clinics and family welfare centres where any help or advice about family planning is available free of cost. The symbol is displayed along with a slogan Small Family, Happy Family.

Every year May 28 is observed as Menstrual Hygiene day to make girls and women aware of maintaining menstrual hygiene and importance of menstrual hygiene for good health. By way of awareness through films, discussions and campaigns menstrual hygiene has taken quite the centre stage in recent days.

The menstrual hygiene scheme to provide subsidized sanitary napkins was launched by the Health ministry in 2011. In Tamil Nadu, UNICEF has developed an affordable incinerator that uses firewood to handle sanitary napkin waste at schools and special wells are equipped where sanitary napkins are composed.

Choose the best answers:

1. The plant which propagates with the help of its leaves is _____

- (a) Onion
- (b) Neem
- (c) Ginger
- (d) Bryophyllum

2. Asexual reproduction takes place through budding in _____

- (a) Amoeba
- (b) Yeast
- (c) Plasmodium
- (d) Bacteria

3. Syngamy results in the formation of _____

- (a) Zoospores
- (b) Conidia
- (c) Zygote
- (d) Chlamydospores

4. The essential parts of a flower are _____

- (a) Calyx and Corolla
- (b) Calyx and Androecium
- (c) Corolla and Gynoecium
- (d) Androecium and Gynoecium

5. Anemophilous flowers have _____

- (a) Sessile stigma
- (b) Small smooth stigma

(c) Coloured flower

(d) Large feathery stigma

6. Male gametes in angiosperms are formed by the division of _____

(a) Generative cell

(b) Vegetative cell

(c) Microspore mothercell

(d) Microspore

7. What is true of gametes?

(a) They are diploid

(b) They give rise to gonads

(c) They produce hormones

(d) They are formed from gonads

8. A single highly coiled tube where sperms are stored, get concentrated and mature is known as

(a) Epididymis

(b) Vasa efferentia

(c) Vas deferens

(d) Seminiferous tubules

9. The large elongated cells that provide nutrition to developing sperms are

(a) Primary germ cells

(b) Sertoli cells

(c) Leydig cells

(d) Spermatogonia

10. Estrogen is secreted by

(a) Anterior pituitary

(b) Primary follicle

(c) Graffian follicle

(d) Corpus luteum

11. Which one of the following is an IUCD?

(a) Copper – T

(b) Oral pills

(c) Diaphragm

(d) Tubectomy

Fill in the blanks:

1. The embryo sac in a typical dicot at the time of fertilization is _____

- a. Male Gametophyte
- b. Female Gametophyte
- c. Gametophyte
- d. None of the above

2. After fertilization the ovary develops into _____

- a. Seed
- b. Flower
- c. Fruit
- d. None of the above

3. Planaria reproduces asexually by _____

- a. Regeneration
- b. Budding
- c. Pollination
- d. None of the above

4. Fertilization is _____ in humans.

- a. External
- b. Internal
- c. Intermediate
- d. None of the above

5. The implantation of the embryo occurs at about _____ day of fertilization.

- a. 6 to 7
- b. 6 to 8
- c. 6 to 9
- d. 6 to 10

6. _____ is the first secretion from the mammary gland after child birth.

- a. Milk
- b. Colostrum
- c. Plasma
- d. None of the above

7. Prolactin is a hormone produced by _____

- a. Posterior Pituitary
- b. Anterior Pituitary
- c. Pituitary
- d. None of the above

(a) Match the following:

Column I Column 2

1. Fission - Spirogyra
2. Budding - Amoeba
3. Fragmentation - Yeast

(b) Match the following terms with their respective meanings:

- (a) Parturition - Duration between pregnancy and birth
- (b) Gestation - Attachment of zygote to endometrium
- (c) Ovulation - Delivery of baby from uterus
- (d) Implantation - Release of egg from Graafian follicle

State true or false. If false, correct the statement:

1. Stalk of the ovule is called pedicle.
2. Seeds are the product of asexual reproduction.
3. Yeast reproduces asexually by means of multiple fission.
4. The part of the pistil which serves as a receptive structure for the pollen is called as style.
5. Insect pollinated flowers are characterized by dry and smooth pollen.
6. Sex organ produce gametes which are diploid.
7. LH is secreted by the posterior pituitary.
8. Menstrual cycle ceases during pregnancy.
9. Surgical methods of contraception prevent gamete formulation.
10. The increased level of estrogen and progesterone is responsible for menstruation.

Answers:**Choose the following:**

1. Bryophyllum 2. Yeast 3. Zygote 4. Androceium and Gynoecium 5. Large feathery stigma 6. Generative cell
7. They are formed from gonads 8. Epididymis 9. Sertoli cells 10. Graafian Follicle 11. Copper T

Fill in the blanks:

1. Female Gametophyte 2. Fruit 3. Regeneration 4. Internal 5. 6 to 7 6. Colostrum 7. Anterior Pituitary

Match the Following:

a)

1. Amoeba 2. Yeast 3. Spirogyra.

b)

1. Delivery of baby from uterus
2. Duration between pregnancy and birth
3. Release of egg from Graafian follicle
4. Attachment of zygote to endometrium

True or False:

1. False – Stalk of the ovule is called funiculus.
2. False – Seeds are the product of Sexual reproduction.
3. False – Yeast reproduces asexually by means of budding.
4. False – The part of the pistil which serves as a receptive structure for the pollen is called as stigma.
5. False – Insect pollinated flowers are characterized by larger and spiny pollen.
6. False – Sex organs produce gametes, which are haploid.
7. False – LH is secreted by the anterior pituitary.
8. True
9. True
10. False - The decreased level of estrogen and progesterone is responsible for menstruation

10th Science Lesson 18**18] Genetics****Do You Know?**

Punnett square is a checker board form devised by a British geneticist. R.C. Punnett for study of genetics. It is a graphical representation to calculate the probability of all possible genotypes of offsprings in a genetic cross.

T.H Morgan was awarded Nobel Prize in 1933 for determining the role of chromosomes in heredity.

Telomeres act as aging clock in every cell. Telomeres are protective sequences of nucleotides found in chromosomes. As a cell divides every time, they become shorter. Telomeres get too short to do their job, causing our cells to age.

Chargaff rule of DNA base pairing: Erwin Chargaff states that in DNA, the proportion of adenine is always equal to that of thymine and the proportion of guanine always equal to that of cytosine.

Sickle cell anaemia is caused by the mutation of a single gene. Alteration in the gene brings a change in the structure of the protein part of haemoglobin molecule. Due to the change in the protein molecule, the red blood cell (RBC) that carries the haemoglobin is sickle shaped.

Choose the best answers:

1. According to Mendel alleles have the following character
 - (a) Pair of genes
 - (b) Responsible for character
 - (c) Production of gametes

(d) Recessive factors

2. 9 : 3 : 3 : 1 ratio is due to

(a) Segregation

(b) Aneuploidy

(c) Euploidy

(d) Polyploidy

3. The region of the chromosome where the spindle fibres get attached during cell division

(a) Chromomere

(b) Centrosome

(c) Centromere

(d) Chromonema

4. The centromere is found at the centre of the _____ chromosome.

(a) Telocentric

(b) Metacentric

(c) Sub-metacentric

(d) Acrocentric

5. The _____ units forms the backbone of the DNA.

(a) 5 carbon sugar

(b) Phosphate

(c) Nitrogenous bases

(d) Sugar phosphate

6. Okasaki fragments are joined together by _____

(a) Helicase

(b) DNA polymerase

(c) RNA primer

(d) DNA ligase

7. The number of chromosomes found in human beings are _____

(a) 22 pairs of autosomes and 1 pair of allosomes

(b) 22 autosomes and 1 allosome

(c) 46 autosomes

(d) 46 pairs autosomes and 1 pair of allosomes

8. The loss of one more chromosome in a ploidy is called _____

- (a) Tetraploidy
- (b) Aneuploidy
- (c) Euploidy
- (d) Polyploidy

Fill in the blanks:

1. The pairs of contrasting character (traits) of Mendel are called _____

- a. Genes
- b. Alleles
- c. Allotropes
- d. None of the above

2. Physical expression of a gene is called _____

- a. Phenotype
- b. Genotype
- c. Allotrope
- d. None of the above

3. The thin thread like structures found in the nucleus of each cell are called _____

- a. Gene
- b. Centromere
- c. Chromosomes
- d. None of the above

4. DNA consists of two _____ chains.

- a. Nucleotide
- b. Di nucleotide
- c. Tri Nucleotide
- d. Poly nucleotide

5. An inheritable change in the amount or the structure of a gene or a chromosome is called _____

- a. Mutation
- b. Hybridization
- c. Gene alteration
- d. Gene Modification

State true or false. If false, correct the statement:

- 1. A typical mendelian dihybrid ration of F generation is 3:1.
- 2. A recessive factor is altered by the presence of a dominant factor.
- 3. Each gamete has only one allele of a gene.

4. Hybrid is an offspring from a cross between genetically different parent.

5. Some of the chromosomes have an elongated knob-like appendages known as telomere.

6. New nucleotides are added and new complementary strand of DNA is formed with the help of enzyme DNA polymerase.

7. Down's syndrome is the genetic condition with 45 chromosomes.

Match the following:

1. Autosomes - Trisomy 21

2. Diploid condition - 9:3:3:1

3. Allosome - 22 pair chromosome

4. Down's syndrome - 2n

5. Dihybrid ratio - 23rd pair of chromosome.

Answers:

Choose the correct answers:

1. Pair of genes 2. Independent assortment 3. Centromere 4. Metacentric 5. Nitrogenous bases 6. DNA Ligase

7. 22 pairs of autosomes and 1 pair of allosomes 8. Aneuploidy

Fill in the blanks:

1. Alleles 2. Phenotypes 3. Chromosomes 4. Polynucleotide 5. Mutation

True or false:

1. False - A typical Mendelian dihybrid ratio of F₂ generation is 9:3:3:1.

2. True

3. True

4. True

5. False - Some of the chromosomes have an elongated knob – like appendage known as the satellite.

6. True

7. False - Down's syndrome is the genetic condition with 21 chromosomes.

Match the following:

1. 22 pair chromosome 2. 2n 3. 23rd pair of chromosome. 4. Trisomy 21 5. 9:3:3:1

10th Science Lesson 19

19] Origin And Evolution Of Life

Do You Know?

Relationship between mutation and variation: Mutation and variation are two events involved in the process of evolution. Mutation arises due to errors occurring in DNA during replication or exposure to UV rays or chemicals. Mutation leads to variation. It brings about changes in a single individual.

Living fossils: These are living organisms that are similar in appearance to their fossilized distant ancestors and usually have no extinct close features. E.g. Ginkgo Biloba.

What is the Geologic time scale? The geological time scale is a system of chronological dating that relates geological rock strata to time, and is used by geologists, palaeontologists, and other Earth scientists to describe the timing and relationships of events that have occurred during earth's history.

Thiruvakkarai fossil wood park (villupuram district, Tamil Nadu) : 2 million years ago tree trunks that got buried along the river, in course of time the organic matter was replaced by silica and was fossilized. They retained their colour, shape and texture and was converted into solid rocks. The annular rings, the texture, the colours of the layers properties of plants are still visible.

NASA is developing the Mars 2020 astrobiologically relevant ancient environment on Mars, its surface geological processes and the preservation of biosignatures within accessible geological materials.

Choose the best answers:

1. Biogenetic law states that _____

- (a) Ontogeny and phylogeny go together
- (b) Ontogeny recapitulates phylogeny
- (c) Phylogeny recapitulates ontogeny
- (d) There is no relationship between phylogeny ontogeny

2. The 'use and disuse theory' was proposed by _____

- (a) Charles Darwin
- (b) Ernst Haeckel
- (c) Jean Baptiste Lamarck
- (d) Gregor Mendel

3. Paleontologists deal with

- (a) Embryological evidences
- (b) Fossil evidences
- (c) Vestigial organ evidence
- (d) All the above

4. The best way of direct dating fossils of recent origin is by

- (a) Radio-carbon method
- (b) Uranium lead method
- (c) Potassium-argon method
- (d) Both (a) and (c)

5. The term Ethnobotany was coined by

(a) Khorana

(b) J.W. Harsbberger

(c) Ronald Ross

(d) Hugo de Vries

Fill in the blanks:

1. The characters developed by the animals during their life time, in response to the environmental changes are called _____

- a. Adulterated Characters
- b. Unaltered Characters
- c. Altered Characters
- d. None of the above

2. The degenerated and non-functional organs found in an organism are called _____

- a. Vestigial organ
- b. Receptor organ
- c. Locomotive organ
- d. None of the above

3. The forelimbs of bat and human are examples of _____ organs.

- a. Homologus
- b. Bi logus
- c. Heterologus
- d. None of the above

4. The theory of natural selection for evolution was proposed by _____

- a. Khorana
- b. J.W. Harsbberger
- c. Ronald Ross
- d. Charles darwin

State true or false. If false, correct the statement:

1. The use and disuse theory of organs was postulated by Charles Darwin.

2. The homologous organs look similar and perform similar functions but they have different origin and developmental pattern.

3. Birds have evolved from reptiles.

Match the following:

Column A Column B

(a) Atavism - Caudal vertebrae and vermiform appendix

(b) Vestigial organs - A forelimb of a cat and a bat's wing

(c) Analogous organs - Rudimentary tail and thick hair on the body

(d) Homologous organs - A wing of a bat and a wing of an insect

(e) Wood park - Radiocarbon dating

(f) W.F. Libby - Thiruvakkarai

Answer:

Choose the correct answers:

1. Ontogeny recapitulates phylogeny 2. Jean Baptiste Lamarck 3. Fossil evidences 4. Radio – carbon method 5. J.W. Harshberger

Fill in the blanks:

1. Acquired characters 2. Vestigial organ 3. Homologous 4. Charles Darwin.

True or False:

1. False – The use and disuse theory of organs was postulated by Jean Baptiste Lamarck
2. False – The homologous organs look dissimilar and perform dissimilar functions, but they have the same origin and developmental pattern
3. True

Match the following:

1. (c) rudimentary tail and thick hair on the body
2. (a) caudal vertebrae and vermiform appendix
3. (d) a wing of a bat and a wing of an insect
4. (b) a forelimb of a cat and a bat's wing
5. (f) Thiruvakkarai
6. (e) radiocarbon dating.

10th Science Lesson 20

20] Breeding And Biotechnology

Do You Know?

Dr.G. Nammalvar (1938-2013) was a Tamil agricultural scientist, environmental activist and organic farming expert. He founded Nammalvar Ecological Foundation for Farm Research and Global Food Security Trust (NEFFFRGFST – Vanagam) to create public awareness about the benefits of organic farming.

Dr.M.S. Swaminatha: Dr.Mankombu Sambasivan Swaminathan is an Indian scientist known for his leading role in India's Green Revolution. His research on potato, wheat, rice and jute are well known plant breeding experiments. Due to his efforts the wheat production increased from twelve million tonnes in 1960's to seventy million tonnes now. He is aptly called as the "Father of Indian Green Revolution".

Gamma Garden or atomic garden is a concept popularised after World War II for the peaceful use of atomic energy for crop improvement. This is a type of induced mutation breeding where radio active sources particularly gamma rays from Cobalt-60 or Caesium-137 are used to induce desirable mutations in crop plants.

Cross breed of fowls: White leghorn X Plymouth Rock; Hybrid fowl – yield more eggs

Cross breed of cows: Developed by mating the bulls of exotic breeds and cows of indigenous breeds. Brown swiss X sahiwal; Karan Swiss – yield 2-3 times more milk than indigenous cows.

Plasmid is the small circular double stranded DNA molecule found in the cytoplasm of bacterial cell and separated from chromosomal DNA. It can replicate independently.

Restriction enzymes recognise a specific base pair sequence (palindromic sequence) in DNA CALLED AS restriction site and cleaves the phosphodiester bond within DNA.

Development of dolly: Dolly was the first cloned female sheep, developed by Dr. Ian Wilmut and his colleagues at the Roslin Institute, Scotland in July 1996. She was created by somatic cell nuclear transfer technique. She lived for 6.5 years and died in 2003 because of lung disease.

Eli Lilly and company, United States, in 1979 first started commercial production of human insulin by using rDNA technology.

Choose the best answers:

1. Which method of crop improvement can be practised by a farmer if he is inexperienced?

- (a) clonal selection
- (b) mass selection
- (c) pureline selection
- (d) hybridisation

2. Pusa Komal is a disease resistant variety of _____

- (a) sugarcane
- (b) Rice
- (c) Cow pea
- (d) Maize

3. Himgiri developed by hybridisation and selection for disease resistance against rust pathogens is a variety of _____

- (a) chilli
- (b) Maize
- (c) sugarcane
- (d) Wheat

4. The miracle rice which saved millions of lives and celebrated its 50th birthday is _____

- (a) IR 8
- (b) IR 24
- (c) Atomita 2
- (d) Ponni

5. Which of the following is used to produce products useful to humans by biotechnology techniques?

- (a) enzyme from organism
- (b) Live organism
- (c) Vitamins
- (d) Both (a) and (b)

6. We can cut the DNA with the help of

- (a) scissors
- (b) restriction endonuclease
- (c) knife
- (d) RNAase

7. rDNA is a

- (a) Vector DNA
- (b) Circular DNA
- (c) Recombinant of vector DNA and desired DNA
- (d) Satellite DNA

8. DNA fingerprinting is based on the principle of identifying _____ sequences of DNA.

- (a) single stranded
- (b) Mutated
- (c) Polymorphic
- (d) Repetitive

9. Organisms with modified endogenous gene or a foreign gene are also known as

- (a) Transgenic organisms
- (b) Genetically modified
- (c) Mutated
- (d) Both a and b

10. In a hexaploid wheat ($2n = 6x = 42$) the haploid (n) and the basic (x) number of chromosomes respectively are

- (a) $n = 7$ and $x = 21$
- (b) $n = 21$ and $x = 21$
- (c) $n = 7$ and $x = 7$
- (d) $n = 21$ and $x = 7$

Fill in the blanks:

1. Economically important crop plants with superior quality are raised by _____
2. A protein rich wheat variety is _____
3. _____ is the chemical used for doubling the chromosomes.
4. The scientific process which produces crop plants enriched with desirable nutrients is called _____
5. Rice normally grows well in alluvial soil, but _____ is a rice variety produced by mutation breeding that grows well in saline soil.
6. _____ technique made it possible to genetically engineer living organism.
7. Restriction endonucleases cut the DNA molecule at specific positions known as _____
8. Similar DNA fingerprinting is obtained for _____
9. _____ cells are undifferentiated mass of cells.
10. In gene cloning the DNA of interest is integrated in a _____

State true or false. If false, correct the statement:

1. Raphanobrasica is a man-made tetraploid produced by colchicinetreatment.
2. The process of producing an organism with more than two sets of chromosome is called mutation.
3. A group of plants produced from a single plant through vegetative or asexual reproduction are called a pureline.
4. Iron fortified rice variety determines the protein quality of the cultivated plant.
5. Golden rice is a hybrid.
6. Bt gene from bacteria can kill insects.
7. In vitro fertilisation means the fertilisation done inside the body.
8. DNA fingerprinting technique was developed by Alec Jeffrey.
9. Molecular scissors refers to DNA ligases.

Match the following:**Column I - Column II**

1. Sonalika - Phaseolus mungo
2. IR 8 - Sugarcane
3. Saccharum - Semi-Dwarf wheat
4. Mung No.1 - Ground nut
5. TMV-2 - Semi-Dwarf Rice
6. Insulin - Bacillus thuringiensis
7. Bt Toxin - Beta carotene

8. Golden rice - first hormone produced using rDNA technique

Consider the statements given below and choose the correct option:

- Assertion is correct and reason is wrong.
- Reason is correct and the assertion is wrong.
- Both assertion and reason is correct.
- Both assertion and reason is wrong.

1. Assertion: Hybrid is superior than either of its parents.

Reason: Hybrid vigour is lost upon inbreeding.

2. Assertion: Colchicine reduces the chromosome number.

Reason: It promotes the movement of sister chromatids to the opposite poles.

3. Assertion: rDNA is superior over hybridisation techniques.

Reason: Desired genes are inserted without introducing the undesirable genes in target organisms.

Answers:

Choose the best answers:

1. clonal selection 2. cow pea 3. wheat. 4. IR 8 5. both (a) and (b) 6. restriction endonucleases 7. recombinant of vector DNA and desired DNA 8. Repetitive transgenic organisms 10. $n = 21$ and $x = 7$

Fill in the blanks:

1. Breeding. 2. Atlas 66. 3. Colchicine. 4. Biofortification. 5. 2 rice 6. Recombinant DNA 7. Molecular scissors 8. Identical twins 9. Pleuripotent 10. Vector [plasmid]

True or False:

- True
- False – The process of producing an organism with more than two sets of chromosome is called polyploidy.
- False – A group of plants produced from a single plant through vegetative or asexual reproduction are called clones.
- False – Iron fortified rice variety determines the iron quality of the cultivated plant.
- False – Golden rice is a genetically modified plant.
- True
- False – In vitro fertilisation means the fertilisation done outside the body.
- True
- False – Molecular scissors refers to Restriction Enzymes.

Match the following:

- (c) Semi – dwarf wheat
- (e) Semi – dwarf Rice
- (b) Sugarcane
- (a) Phaseolus mungo

5 - (d) Groundnut

6 - (h) the first hormone produced using rDNA technique

7 - (f) *Bacillus thuringiensis*

8 - (g) Beta carotene

Reason and assertion:

1. Assertion is correct and reason is wrong.
2. Both assertion and reason is wrong
3. Both assertion and reason is correct.

10th Science Lesson 21

21] Health And Diseases

Do You Know?

The ministry of women and child development championed the introduction of the protection of children from sexual offences (POCSO) Act, 2012. People who traffic children for sexual purpose are also punishable under the provisions relating to the Act.

Objectives of the POCSO Act, 2012: To protect children from the offences of sexual assault, sexual harassment, pornography. To establish special courts for speedy trial of such offences.

The National Commission for Protection of Child Rights (NCPCR) was set up in March 2007 under the commissions for protection of child rights (CPCR) Act, 2005. This act emphasizes the principle of universality and inviolability of child rights and recognizes the tone of urgency in all the child related policies of the country. Protection of all children of all age group upto 18 years of age is of equal importance. Policies define priority actions for the most vulnerable children.

World Health organization (WHO) 1984 suggested the use of the term drug dependence in place of drug addiction or drug abuse.

International Day against Drug Abuse and illicit trafficking – June 26. Narcotic drugs and psychotropic substances act was introduced in 1985.

World health organization (WHO) 1984 suggested the use of the term drug. WHO issued a directive under which all cigarette advertisements and packs carry a statutory warning "Smoking is injurious to Health".

Anti tobacco act was passed on May 1st 2004. By 2030 tobacco is expected to be single biggest cause of death worldwide accounting for 10 million deaths per year.

May 31st is observed as no tobacco day (World anti-tobacco Day)

One in every 8 individuals in India is a diabetic. The revised WHO estimates for the year 2025 is 57.2 million diabetics in India. The average age for the onset of diabetes is 40 years, while it is 55 years in other countries. World Health Organization projects that diabetes will be 7th leading cause of death by the year 2030.

According to WHO recommendation, if the fasting blood glucose is greater than 140 mg/dl or the random blood glucose is greater than 200 mg dl on more than two occasions, diagnosis for confirming diabetes is essential.

Flax seeds containing insoluble fibre, Guavas, Tomatoes and Spinach are foods which help reduce blood sugar levels.

Every 7 calories of excess consumption lead to 1 gm fat deposit and increase in body weight. Weight due to fat in adipose tissue exceeds more than 20% to 25% of body weight. An adult weighing 10% more than the standard weight is OVERWEIGHT and 20% more is OBESE.

HDL (high Density Lipoprotein) or "good" cholesterol lowers risk of heart disease while LDL (Low Density Lipoprotein) or "bad" cholesterol increases risk of heart disease.

Desirable level for blood cholesterol should be less than 200 mg/dl for Indians. The risk of coronary heart disease increases slowly as blood cholesterol levels increases from 200 to 300 mg/dl.

World Cancer Day – 4th February.

National Cancer Awareness Day – 7th November.

Types of Tumours: Benign tumours or Non malignant tumours: Remain confined in the organ affected and do not spread to other parts of the Body.

Malignant tumours: Mass of proliferating cells which grow very rapidly invading and damaging the surrounding normal tissues.

Dr. Suniti Solomon, pioneered HIV research and treatment in India. She set up the first voluntary testing and counselling centre and an AIDS Research group in Chennai during 80's. Her team was the first to document evidence of HIV infection in India in 1985 (First Indian AIDS patient in Chennai).

Many people are ignorant about AIDS and it has been said that – "don't" die of ignorance". In our country NACO (National AIDS Control Organization) and other NGO's (Non-Governmental Organizations) are educating people about AIDS. Every year December 1st is observed as the "world AIDS Day".

Choose the best answers:

1. Tobacco consumption is known to stimulate secretion of adrenaline. The component causing this could be

- (a) Nicotine
- (b) Tannic acid
- (c) Curcumin
- (d) Leptin

2. World 'No Tobacco Day' is observed on

- (a) May 31
- (b) June 6
- (c) April 22
- (d) October 2

3. Cancer cells are more easily damaged by radiations than normal cells because they are

- (a) Different in structure
- (b) Non-dividing

(c) Mutated Cells

(d) Undergoing rapid division

4. Which type of cancer affects lymph nodes and spleen?

(a) Carcinoma

(b) Sarcoma

(c) Leukemia

(d) Lymphoma

5. Excessive consumption of alcohol leads to

(a) Loss of memory

(b) Cirrhosis of liver

(c) State of hallucination

(d) Suppression of brain function

6. Coronary heart disease is due to

(a) Streptococci bacteria

(b) Inflammation of pericardium

(c) Weakening of heart valves

(d) Insufficient blood supply to heart muscles

7. Cancer of the epithelial cells is called

(a) Leukemia

(b) Sarcoma

(c) Carcinoma

(d) Lipoma

8. Metastasis is associated with

(a) Malignant tumour

(b) Benign tumour

(c) Both (a) and (b)

(d) Crown gall tumour

9. Polyphagia is a condition seen in

(a) Obesity

(b) Diabetes mellitus

(c) Diabetes insipidus

(d) AIDS

10. Where does alcohol effect immediately after drinking?

(a) Eyes

(b) Auditory region

(c) Liver

(d) Central nervous system

State true or false. If false, correct the statement:

1. AIDS is an epidemic disease.
2. Cancer causing genes are called Oncogenes.
3. Obesity is characterized by tumour formation.
4. In leukemia both WBCs and RBCs increase in number.
5. Study of cause of disease is called etiology.
6. AIDS is not transmitted by contact with a patient's clothes.
7. Type 2 diabetes mellitus results due to insulin deficiency.
8. Carcinogens are cancer causing agents.
9. Nicotine is a narcotic drug.
10. Cirrhosis is associated with brain disorder.

Expand the following abbreviations:

1. IDDM 2. HIV 3. BMI 4. AIDS 5. CHD 6. NIDDM

Match the following:

1. Sarcoma - Stomach cancer
2. Carcinoma - Excessive thirst
3. Polydipsia - Excessive hunger
4. Polyphagia - Lack of blood flow to heart muscle
5. Myocardial infraction - Connective tissue cancer

Fill in the blanks:

1. Cirrhosis is caused in liver due to excessive use of _____
 - a. Tobacco
 - b. Alcohol
 - c. Pan Masala

d. None of the above

2. A highly poisonous chemicals derived from tobacco is _____

- a. Nicotine
- b. Ethyl Alcohol
- c. Sodium
- d. None of the above

3. Blood cancer is called _____

- a. Anaemia
- b. Leukaemia
- c. Carcinoma
- d. None of the above

4. Less response of a drug to a specific dose with repeated use is called _____

- a. Anti Microbial
- b. Tolerance
- c. Intolerance
- d. None of the above

5. Insulin resistance is a condition in _____ diabetes mellitus.

- a. Type – 1
- b. Type - 2
- c. Type - 3
- d. Type - 4

Complete the analogy:

1. Communicable: AIDS: Non communicable: _____

2. Chemotherapy: Chemicals: Radiation therapy: _____

3. Hypertension: Hypercholesterolemia: Glycosuria: _____

Answers:

Choose the correct answers:

1. Nicotine 2. May 31 3. Undergoing rapid division 4. Leukemia 5. Cirrhosis of liver 6. Insufficient blood supply to heart muscles

7. Carcinoma 8. Malignant tumor 9. Diabetes mellitus 10. Central Nervous System

True or False:

- 1. False – AIDS is a viral disease.
- 2. True
- 3. False – Obesity is characterized by an accumulation of excess body fat with an abnormal increase in body weight.
- 4. False - Leukemia is characterized by an increase in the formation of white blood cells in the bone marrow and lymph nodes.

5. False - Study of a cause of the disease is called Pathology.
6. True
7. False - In type 2 diabetes mellitus, Insulin production by the Pancreas is normal, but the target cells do not respond to insulin.
8. True
9. False – Nicotine is a stimulant, highly harmful and poisonous substance, in Tobacco.
10. False – Liver damage resulting in Fatty liver which leads to Cirrhosis and formation of fibrous tissues.

Expand the following:

1. Insulin Dependent Diabetes Mellitus
2. Human Immunodeficiency Virus
3. Body Mass Index
4. Acquired Immuno Deficiency Syndrome
5. Coronary Heart Disease
6. Non – Insulin Dependent Diabetes Mellitus.

Match the following:

- 1 - (e) Connective tissue cancer
- 2 - (a) Stomach cancer
- 3 - (b) Excessive thirst
- 4 - (c) Excessive hunger
- 5 - (d) Lack of blood flow to the heart muscle.

Analogy type questions:

1. Obesity
2. Radiation
3. Polyphagia

10th Science Lesson 22**22| Environmental Management****Do You Know?**

Chipko movement: The Chipko movement was a non-violent agitation in 1973 that was aimed at protection and conservation of trees. The name of the movement 'Chipko' comes from the word 'embrace', as the villagers hugged the trees and encircled them to prevent them from being cut. The movement originated in the Chamoli district of Uttar Pradesh (now Uttarakhand). The protest of Chipko movement achieved a major victory in 1980 with a 15-year ban on cutting trees in the Himalayan forests.

Jim Corbett National Park was the first to be established in 1936 in Uttarakhand, India. There are 15 biosphere reserves in India. The Nilgiris is a biosphere reserve in Tamil Nadu.

RathikaRamasamy, a native of Venkatachalapuram village, Theni District in Tamil Nadu was the first Indian woman to strike an International reputation as wildlife photographer. Her passion is towards bird photography. A photobook on wildlife titled "The best of wildlife moments" was published in November 2014.

Wildlife Conservation Initiatives in India: Project Tiger and Project Elephant has been launched in 1973 and 1992 respectively. Crocodile Conservation Project was launched in 1976. Sea Turtle Conservation Project was launched in 1999. Indian Rhino Vision 2020 is to conserve at least 3000 greater one-horned rhinos in Assam, India by 2020.

India is the third largest consumer of crude oil in the world, after the United States and China.

Case study of Taj Mahal: The Taj Mahal is one of the seven wonders of the world and is located in Agra, Uttarpradesh. It is built with white marble. The Mathura oil refinery owned by Indian Oil Corporation present around this area produce sulphur and nitrogen oxides. The white marble became yellow due to air pollution. The Government of India has set up emission standards around the monuments to protect it from the damage.

A capacity of 100 litres solar heater can save upto 1500 units of electricity per year.

India has identified six basins as areas for shale gas exploration: Cambay (Gujarat), Assam – Arakan (North East), Gondwana (Central India), Krishna Godavari onshore (East Coast), Cauvery onshore and Indo-Gangetic basins.

The world's largest and tallest wind turbine is situated in Hawaii. One wind turbine can produce electricity for 300 homes.

Kallanai Dam, also known as Grand Anicut, is the fourth oldest dam in the world, constructed by King KarikalaChola of the CholaDynasty in the 2nd century A.D. (CE). It still serves the people of Tamil Nadu, The dam is located on the River Kaveri, approximately 20 km from the city of Tiruchirapalli.

E-wastes include: Computer components – 66%, Telecommunication components – 12%, Electric components – 5%, Biomedical components – 7%, Other components – 6%

Health effects of E-wastes:

Lead: Damages central and peripheral nervous system; affect brain development in children.

Chromium: Asthmatic bronchitis.

Cadmium: Accumulates in kidney and liver; neural damage

Mercury: Chronic damage to brain and respiratory system.

Plastics including Polyvinyl Chloride (PVC) : Burning produces dioxin which can cause developmental and reproductive problems, damages the immuns system.

Fill in the blanks:

1. Deforestation leads to _____ in rainfall.

- Increase
- Decrease
- Remains the same
- None of the above

2. Removal of soil particles from the land is called _____

- Soil erosion

- b. Soil degradation
- c. Soil Preparation
- d. None of the above

3. Chipko movement is initiated against _____

- a. Cutting down of trees
- b. Planting of trees
- c. Transplanting of trees
- d. None of the above

4. _____ is a biosphere reserve in Tamil Nadu.

- a. Point calimere
- b. Mudumalai
- c. Mudanthurai
- d. Nilgiris

5. Tidal energy is _____ type of energy.

- a. Renewable
- b. Non renewable
- c. Water
- d. None of the above

6. Coal, petroleum and natural gas are called _____ fuels.

- a. Fossil
- b. Nuclear
- c. Renewable
- d. None of the above

7. _____ is the most commonly used fuel for the production of electricity.

- a. Water
- b. Coal
- c. Wind
- d. None of the above

State true or false. If false, correct the statement:

1. Biogas is a fossil fuel.
2. Planting trees increases the groundwater level.
3. Habitat destruction cause loss of wild life.
4. Nuclear energy is a renewable energy.
5. Overgrazing prevents soil erosion.
6. Poaching of wild animals is a legal act.
7. National park is a protected park.
8. Wild life protection act was established in 1972.

Match the following:

1. Soil erosion - energy saving
2. Bio gas - acid rain
3. Natural gas - removal of vegetation
4. Green house gas - renewable energy
5. CFL bulbs - CO₂
6. Wind - non-renewable energy
7. Solid waste - lead and heavy metals

Choose the best answers:

1. Which of the following is/are a fossil fuel?
i. Tar ii. Coal iii. Petroleum
(a) i only
(b) i and ii
(c) ii and iii
(d) i, ii and iii
2. What are the steps will you adopt for better waste management?
(a) Reduce the amount of waste formed
(b) Reuse the waste
(c) Recycle the waste
(d) All of the above
3. The gas released from vehicles exhaust are
i. Carbon monoxide ii. Sulphur dioxide iii. Oxides of nitrogen
(a) i and ii
(b) i and iii
(c) ii and iii
(d) i, ii and iii
4. Soil erosion can be prevented by
(a) Deforestation
(b) Afforestation
(c) Over growing

(d) Removal of vegetation

5. A renewable source of energy is

- (a) Petroleum
- (b) Coal
- (c) Nuclear fuel
- (d) Trees

6. Soil erosion is more where there is

- (a) No rainfall
- (b) Low rainfall
- (c) Rainfall is high
- (d) None of these

7. An inexhaustible resource is

- (a) Wind power
- (b) Soil fertility
- (c) Wild life
- (d) All of the above

8. Common energy source in village is

- (a) Electricity
- (b) Coal
- (c) Biogas
- (d) Wood and animal dung

9. Green house effect refers to

- (a) Cooling of earth
- (b) Trapping of UV rays
- (c) Cultivation of plants
- (d) Warming of earth

10. A cheap, conventional, commercial and inexhaustible source of energy is

- (a) Hydropower
- (b) Solar energy
- (c) Wind energy

(d) Thermal energy

11. Global warming will cause

(a) Raise in level of oceans

(b) Melting of glaciers

(c) Sinking of islands

(d) All of these

12. Which of the following statement is wrong with respect to wind energy

(a) Wind energy is a renewable energy

(b) The blades of wind mill are operated with the help of electric motor

(c) Production of wind energy is pollution free

(d) Usage of wind energy can reduce the consumption of fossil fuels

Consider the statements given below and choose the correct option:

In each of the following question a statement of assertion (A) is given and a corresponding statement of a reason (R). Of the four statements given below mark the correct answer:

(a) Both assertion and reason are true and reason is correct explanation of assertion

(b) Both assertion and reason are true but reason is not the correct explanation of assertion

(c) Assertion is true but reason is false

(d) Both assertion and reason are false

1. Assertion: Rainwater harvesting is to collect and store rain water.

Reason: Rainwater can be directed to recharge the underground water source.

2. Assertion: Energy efficient bulbs like CFL must be used to save electric energy.

Reason: CFL bulbs are costlier than ordinary bulbs, hence using ordinary bulbs can save our money.

Answer:

Fill in the blanks:

1. Reduction 2. Soil erosion 3. The cutting down of trees 4. Nilgiris 5. Renewable 6. Fossil 7. Coal

True or false:

1.False - Biogas is the mixture of methane, hydrogen sulphide, carbon-di-oxide and hydrogen.

2.True

3.True

4.False – Nuclear energy is a non-renewable energy source. The material used in nuclear plants is not renewable.

5.False – During overgrazing, most of the plants are eaten up. If the plants or vegetation is retained, the soil is not exposed. Soil erosion occurs due to overgrazing.

6.False – Poaching should be prohibited.

7.True

8.True

Match the following:

- 1.(c) Removal of vegetation
- 2.(d) Renewable energy
- 3.(f) Non-renewable energy
- 4.(e) CO₂
- 5.(a) energy saving
- 6.(b) acid rain
- 7.(g) Lead and heavy metals

Choose the best answer:

- 1.ii and iii 2. All the above 3. i, ii and iii 4. Afforestation 5. Trees 6. Rain fall is high 7.all of the above 8. Wood and animal dung
9. Warming of earth 10. Wind energy 11.all of these 12.the blades of wind mill are operated with the help of electric motor

Reason and Assertion:

1. Both assertion and reason are true and reason is correct explanation of assertion
2. Assertion is true but reason is false.

10th Science Lesson 23

23] Visual Communication

Choose the best answers:

1. Which software is used to create animation?
 - (a) Paint
 - (b) PDF
 - (c) MS Word
 - (d) Scratch
2. All files are stored in the _____
 - (a) Folder
 - (b) Box
 - (c) Pai
 - (d) Scanner
3. Which is used to build scripts?
 - (a) Script area
 - (b) Block palette

(c) Stage

(d) Sprite

4. Which is used to edit programs?

(a) Inkscape

(b) Script editor

(c) Stage

(d) Sprite

5. Where you will create category of blocks?

(a) Block palette

(b) Block menu

(c) Script area

(d) Sprite

Match the following:

1. Script Area - Type notes

2. Folder - Animation software

3. Scratch - Edit programs

4. Costume editor - Store files

5. Notepad - Build Scripts

Answers:

Choose the best answer:

1. Scratch 2. Folder 3. Script area 4. Script writer 5. Block menu

Match the following:

1.(e) Build Scripts

2.(d) Store files

3.(b) Animation software

4.(c) Edit programs

5.(a) Type notes.