9. Force and Pressure

1. Explain the term Force?

   Force is a push or a pull acting on an object which changes or tends to change the state of the object.

2. What is the Unit of Force?

   In the International system of units (SI System), the unit of force is newton (N).

3. What is the reason behind for the unit force (N)?

   Sir Issac Newton (1642 - 1727) One of the greatest scientists the world has ever seen. He was an English- mathematician, -physicist and astronomer. The SI unit of force is named after him.

4. Point out the other Units to measure the force?

   There are also other units that are used to measure force. They are dyne, kilogram weight and pound weight.

5. What is mean by State of Motion?

   A change in either the speed of an object or its direction of motion or both is described as a change in its state of motion. Thus, a force may bring a change in the state of motion of an object.

6. What is Contact Force?

   A force that can cause or change the motion of an object by touching it is called Contact force.

7. What is Muscular Force?

   The force Which is caused by the action of muscles. Hence this force is known as muscular force.

8. What is Frictional Force?

   The ball slows down due to the force acting between the ball and the ground. It is the force of friction which causes the ball to rest. The frictional force is always in a direction opposite to the direction of motion of the object

9. What is Non – Contact Force?

   A non-contact force is any force applied to an object by another body without any contact.

10. Explain Magnetic Force?

    Is it necessary to bring the two magnets in contact to observe the force between them? No. A magnet can exert a force on another magnet without touching it. Magnetic force is a non contact force.

11. What is Gravitational Force?

Why are objects fall towards the earth? It is because the earth pulls them down. This force is called the force of gravity. This is an attractive force. This is an example for non-contact force.

12. What is electrostatic force?

Force exerted by a charged body on another charged or uncharged body is known as electrostatic force. This force acts when the bodies are not in contact. The electrostatic force is another example of non contact force

13. What is Pressure? how will you measure it?

Pressure is defined as the force acting on a unit area. Pressure = Force/ Area on which it acts

The SI unit of pressure is N/m^2. It is also called pascal (Pa)

14. Is Pressure exerted by liquids and gases?

You know that liquids and gases are called fluids. Solids always exert pressure downwards. But the fluids exert pressure in all Directions. Fluids exert pressure on all bodies immersed in them and also on the walls of the container that holds them.

15. Is the Pressure of the liquid is depends upon the Gravitational force .Give one Example?

On the earth we have more gravitational force and hence the pressure exerted by the glass of water will be more. On the moon, the gravitational force is less compared to our earth. Hence the pressure exerted by a glass of water is less on the moon. So, pressure of a liquid depends on gravitational force.

16. How the Pressure of the liquid is calculated?

The pressure of a liquid can also be calculated by using a formula p = hdg

p = pressure of a liquid

h = height of the liquid column

d = density of the liquid

g = acceleration due to gravity

17.Define Pascal's Law.

The pressure applied to an enclosed liquid gets transmitted equally to every part of the liquid. This property was first demonstrated by Pascal and is called Pascal's law.

18.Is Air Exerts pressure on the wall of Objects . Explain it with Example.

We must have walked on the road while there is a strong wind. How did we feel? Did we feel any force while walking against the wind? What happens to the bicycle tube when it has a puncture From the above observations you can say that air also exerts pressure on the walls of their container.

19.What is Atmospheric Pressure?

The earth is surrounded by air all around. This thick envelope of air is called the atmosphere. The atmospheric air extends up to many kilometers above the surface

of the earth. The pressure exerted by this air column is known as the atmospheric pressure.

20.How the Atmospheric pressure is decrease?

The atmospheric pressure at sea level is approximately 1,00,000 N/m^2 (or 10^5 N/m^2). As we go higher and higher above the earth surface, the atmospheric pressure decreases.

21.How the Atmospheric Pressure is Measured?

The atmospheric pressure is not the same at all places. It decreases as we go above the earth's surface. The instrument used to measure the atmospheric pressure is called Barometer.

22.What are the instrument that we used to measure the Atmospheric pressure?

In 1643, an Italian scientist named Torricelli invented the first barometer. It was a mercury barometer. Aneroid barometer and Fortin's barometer are other instruments used to measure the atmospheric pressure.

23.What is Friction?

The force which opposes the action of sliding your foot on the floor is called 'friction'. Friction is the force created whenever two surfaces move or try to move over each other.

24. How was the Friction is Caused?

Friction is caused by the irregularities on the two surfaces in contact. Even those surfaces which appear very smooth have a large number of irregularities on them. Irregularities on the two surfaces lock into one another. When we attempt to move any surface, we have to apply a force to overcome the interlocking. On rough surfaces there are larger number of irregularities. So the force of friction is greater if a rough surface is involved.

25. What are the Factors which are affecting Friction?

The force of friction depends on two main factors 1. Mass of the body 2. Nature of the surfaces in contact As the mass of the body increases, the force of friction also increases. A football when kicked goes farther than a cricket cork ball since the mass of the cricket ball is more than that of the foot ball. Friction is less when the surface is smooth. This you can understand by rolling a stone on a tar road(rough surface) and a house floor (smooth surface).

26. What are the Advantages of Friction?

1. We are able to walk or run properly- on- the- floor- because of friction. If there is less or no friction we will slip and fall down.
2. It would not be possible to light a match stick without friction between its head and the side of the matchbox.

3. Cars and buses are able to run on the roads because of the friction between the wheels and the road.

4. We cannot write on paper without friction between the tip of a pen or a pencil and the paper.

27. What are the Disadvantages of Friction?

1. Friction produces heat. This heat causes wear and tear of the machinery parts.

2. Vehicle tyres and soles of footwear wear out because of friction.