

Force and Pressure

1. What is Force?

Ans. Force is push or pull which applied on a body can change the state of body (either the state of rest or motion) or the change the size or shape of the body.

2. What are the characteristics of Force?

Ans. The characteristics of Force are

- A force can make a stationary object move.
- A force can stop a moving object.
- A force can change the speed of a moving object.
- A force can change the direction of motion of a moving object.
- A force can change the shape of an object.

3. What is the SI unit of Force? Define it.

Ans. SI unit of Force is Newton.

A newton is the force needed to increase the speed of an object of mass 1 kg by 1 m/s in 1s.

4. What is 1 Kgf?

Ans. A kilogram-force is the force that pulls an object of mass 1 kg towards the Earth.

One kilogram-force is equal to approximately 10 N.

5. What is Translatory Motion?

Ans. Movement of the whole object from one point to another is called translatory motion.

6. What is called Moment of Force? Describe it.

Ans. The turning effect of force around a fixed point is called the moment of the force, or moment.

It is also called torque.



Consider an body which is pivoted at a point O. If the force F is applied on the body in the direction FP, the force is unable to produce the linear motion of the body because the body is not free to move. But this force turns the body about the Point O in the direction shown in the figure.

Now the perpendicular distance of the force F from the pivoted point O is OP.

Now the Moment of the force or torque about the point O is

Force \times Perpendicular distance of the force from the point O

Or $\tau = F \times OP$

7. What is the Unit of Torque?

Ans. The SI unit of Torque is Nm and

The CGS unit of Torque is dyne \times cm.

8. What is Pivot and what is Axis of Rotation?

Ans. If a body is not free to move and if it is pivoted at a point, then the force applied on the body can turn it about a point. This point is called Pivot Point.

And the vertical axis passes through the point about which the body turns is called Axis of Rotation.

9. What is Anticlockwise Moment and Clockwise Moment?

Ans. If the force rotates or turns the object in a clockwise direction, the moment is called a clockwise moment. If the force rotates or turns the object in an anticlockwise direction, the moment is called Anticlockwise Moment.

10. Which factors are affecting the turning force of a body?

Ans. The turning force of a body depends on the following factors:

- a. **The magnitude of the force applied:** Longer the magnitude of force applied, more is the turning effect of the body.
- b. **The perpendicular distance of the force from the pivot point:** larger the perpendicular distance of the point at which the force is applied from the pivoted point, more the turning effect of the body.

11. What is Pressure?

Ans. If the force is applied on a surface in the direction $m = \text{normal}$ to the surface, the force is called Thrust.

12. What is the CGS and SI unit of Thrust?

Ans. CGS Unit: gmf

SI Unit: Kgf

13. What is Pressure?

Ans. The amount of force applied per unit area is called pressure.

Pressure = Force / Area

Pressure = Thrust / Area

14. What is SI unit of Pressure? Define it.

Ans. SI unit of Pressure is Pascal (Pa).

It is defined as the pressure exerted by 1 N of force over an area of 1m^2 .

A pascal is equal to 1 newton per square metre.

$1\text{ Pa} = 1\text{ N} / 1\text{ m}^2$

15. What is easier to cut apple with sharp knife or blunt knife?

Ans. It is easier to cut an apple with a sharp knife than with a blunt knife. This is because when you use a sharp knife, the area on which you apply force is small and the pressure that is exerted on the apple is greater.

16. Why Bulldozers or Military tanks have Caterpillar Tracks?

Ans. Bulldozers and military tanks have broad metal tracks called caterpillar tracks over their wheels. The caterpillar tracks help increase the surface in contact with the ground and thus reduce the pressure exerted by the vehicles on the ground.

17. On which factors the Liquid Pressure affects?

Ans. Liquid Pressure depends on the following factors

a. **Height of the Liquid Column:**

As we go deeper into a liquid, the pressure increases. The liquid pressure on the walls of a cylindrical container is lower near the top of the liquid column and higher near the bottom of the liquid column.

b. The density of Liquid

The pressure exerted by a liquid increase as the density of the liquid increases. Recall that density is mass per unit volume, and force is directly related to mass. A denser liquid has greater mass than a less dense one for the same volume and thus exerts greater force over the same area. For example, seawater exerts greater pressure than pure water since it is denser.

18. What is Manometer?

Ans. manometer is an instrument used to measure liquid pressure.

19. What is Atmospheric Pressure?

Ans. The pressure exerted by the atmosphere on the Earth's surface is called atmospheric pressure.

20. What is the unit of Atmospheric Pressure?

Ans. Standard atmospheric pressure was originally defined as the pressure exerted by 760 mm of mercury at mean sea level at 0°C. This pressure was termed one atmosphere (1atm); note that this is not an SI unit.

It is equal to about 101,325 Pa.

1 atm = 101,325 Pa

21. Why liquid suck through straw when a straw is put into liquid.

Ans. When we suck on a straw, air is removed from inside the straw. This results in a lowering of pressure inside the straw. The atmospheric pressure on the surface of the liquid outside will be higher than the pressure inside. This makes the liquid rise in the straw and reach your mouth.

22. Why nose bleeding is happening at high altitude?

Ans. When visiting places on high mountains, some people experience nosebleeds. This is because atmospheric pressure decreases as we ascend into the atmosphere. This is because there are lower amounts of gases pushing down on us as we go higher up. The pressure exerted by the blood is higher than the pressure exerted by the atmosphere on the body. This causes small capillaries to burst in the nose and leads to bleeding.

23. What is Barometer?

Ans. Barometer is an instrument used to measure atmosphere pressure.