BIJENDRA PUBLIC SCHOOL, PURNEA

Class - 8

Subject - SCIENCE

Chapter - 11 FORCE AND PRESSURE

A. Very Short - Answer Questions:

1. When the force applied on an object is doubled, how does the pressure exerted on the object change?

Ans. Gets doubled.

2. Name the force acting between the two surfaces in contact and opposing the motion.

Ans. Frictional force.

3. What is the resultant force of the two forces F_1 and F_2 acting on a body in the opposite direction?

Ans. If resultant force is F, then it will be equal to $F = F_1 - F_2$

4. Define atomospheric pressure.

Ans. The pressure exerted by atmospheric air is known as atmospheric pressure.

5. What is the height of mercury column in a simple barometer at the sea level?

Ans. 76 cm Hg.

B. Short Answer Questions.

1. What are the various units of force?

Ans. The SI unit of force is newton (N) other SI unit of force is kilogram force (kgf). And, the CGS unit of force is dyne.

2. Define, pressure. What is the SI unit of pressure?

Ans. Pressure is defined as the force acting on a unit area.

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$

The SI unit of pressure is newton per square meter (or N/m^2). This unit is also called pascal (Pa).

3. What are the unbalanced forces?

Ans. When the resultant of all the forces acting on a body is zero, the forces are said to be balanced force.

4. Why is a sharp knife more effective in cutting a fruit than a blunt knife?

Ans. A sharp knife has sharper edge due to which it has smaller area of cross section as comparison to blunt knife. So that it creates more pressure in cutting a fruit.

5. Sledges are not provided with wheels. Give reasons.

Ans. Sledges are not provided with wheels because wheels have lesser area of cross section. Hence, it will exert high pressure on the snow and sink deeper into it.

C. Long Answer Questions.

1. Define force Describe with suitable examples, the contact and non-contact (or, action at a distance) forces.

Ans. A push or pull acting on a body which tends tochange its state of rest or of motion is called a force. It is denoted by letter 'F'.

There are two types of forces:

i. Contact force and ii. Non-contact forces

i. Contact force :- is a force which acts only when the objects are in physical contact with each other.

For example :- When a coiled spring is stretched (pulled), the two ends of the spring must be in actual contact with the hands of the person.

ii. Non-contact forces : are those forces which can act even without any actual contact between the two objects.

For example : A magnet can pull iron alpins for a distance.

2. Tractors have large tyres, bulldozers have caterpillar tracks and heavy buses / trucks have eight rear wheels.

Give one reason common to all these.

Ans. Large tyres of tractors, caterpillar tracks of bulldozers and rear wheels of buses / trucks are made broader, and the broad tyres reduce the pressure on the soil or ground and these vehicles could move easily on the ground.

3. How does pressure due to a liquid held in a container very with

a. Depth b. Amount c. Shape and size of the container.

Ans. a. Depth : The pressure of a liquid held in a container is greatest near the lowest region and least near the uppermost region. So the pressure due to liquid increases with depth from the surface of the liquid.

b. Amount :- The pressure of liquid does not depend on the amount of liquid.

c. Shape and size of the container:- The pressure of a liquid does not depend upon the shape and size of a container.

4. State Pascal's law. Give a simple experiment to demonstrate this law.

Ans. According to the Pascal's law the pressure applied at any point on and enclosed liquid gets transmitted equally in all direction.

Experiment : Fill a thick polythene bag with water.

Make several holes in the bag gently.

When we squeeze then we can see water streams out in all directions with equal force.

5. Describe a simple barometer.

Ans. A simple barometer is also called mercury barometer. It is a device which can measure atmospheric pressure. It is made by Er. Torricelli (1608-1647) based on the experiments conducted by him.

D. Tick (✓) the ODD-ONE out giving reasons:

1. Electrostatic Force, Gravitational Force, Muscular Force, Magnetic Force.

Ans. Muscular force: Is the example of contact force and rest three are the example of non- contact forces.

2. Hydraulic disc brakes, Hydraulic pressure, Aneroid barometer, Hydraulic car jack.

Ans. Aneroid Barometer : It is a device i. e. used to measure atmospheric pressure and rest three devices that works on the Pascal's law.

3. Pulling a cart, Kicking a ball, Picking alpins with a magnet, Lifting a suit case.

Ans. Picking alpins with a magnet : This activity is an example of non contact force and rest three activities are the examples of contact forces.

4. Newton, Pascal, Gram force, Kilogram force.

Ans. Pascal: is the unit of pressure and rest three are the units of force.

5. Camel, Drawing pin, Elephant, Tractor.

Ans. Drawing Pin: Has lesser area of cross section so exert's high pressure but the rest three has greater area of cross section and exert's loss pressure on the ground.

E. Define the following terms.

1. Balanced and Unbalanced Forces
2. Magnetic Force
3. Electrostatic Force

Ans. 1. Balanced and Unbalanced Forces

Balanced Forces : When the resultant of all the forces acting on a body is zero, the forces are said to be balanced forces.

Unbalanced Forces : When the resultant of all the forces acting on a body is not zero, the forces are unbalanced forces.

2. Magnetic Force: The force exerted by a magnet is called magnetic force. The magnetic force acts from a distance.
3. Electrostatic Force : The force between two charged bodies, one charged and the other uncharged body due to which they repel or attract each other is called electrostatic force.

F. HOTS: High Order Thinking Skills:

Think and Answer.

1. Define Kilogram Force and the Gram Force. Establish a relation between the two.

Kilogram Force : The force required to lift a body of mass 1 kg vertically is called one kilogram force.

The unit of kilogram force is denoted by the notation Kgf.

Gram Force : The force required to lift a body of mass 1 g vertically is called one gram force. Its unit is denoted by the notation gf.

From the relationship of kilogram - gram,

we can write,

1 Kgf = 1000gf.

and experimentally it is proved that

1 Kgf = 9.8 N

2. Why do all cutting instruments have sharp edges? Give reason.

Ans. All cutting instruments have sharp edges because the sharper cutting edge has smaller area of cross section that's why it can exert more pressure and easily penetrate into the given surface.

3. Can a rubber sucker be stuck on a rough surface? Given reason.

Ans. No, a rubber sucker can't be stuck on a rough surface because rough surface has uneven surface and air will pass through the hole between the rough surface.

4. Why do heavy vehicles have broad tyres?

Ans. Heavy vehicles have broad tyres, that's why it can reduce the pressure with the ground and heavy vehicles could move easily through the ground.