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Force & Pressure - Quiz

SELECT THE CORRECT OPTION

Q1. Which of these is a contact force?

a). Friction b). Magnetic force c). Gravitational force d). Electrostatic force

Q2. A force of 10N acts on an area of 0.1m^2. The force is kept the same but the area is reduced to half. Which of the following is true?

a) The pressure does not change.
b) The pressure reduces to half.
c) The pressure increases by 1.5 times.
d) The pressure doubles.

Q3. What will be the pressure when a 30N force is applied on an area of 120 cm^2?

a). 2.5 X 10^3 N/m^2 b). 5 X 10^4 N/m^2 c). 2.5 X 10^2 N/m^2 d). 5 X 10^3 N/m^2

Answer the following questions

Q1. Size of a bubble increases as it rise towards the surface. Why?

Q2. We prefer to use a sharp nail than a blunt one. Why?

Q3. All pushes and pulls are forces. True or False?

Q4. If a force acts on a body it will move in the direction in which the force acts. True or false?

Q5. The larger the area over which a force acts, the _____ is the pressure.

Q6. Does pressure exerted by a liquid increase or decrease with depth?

Q7. If a body is moving with uniform speed in a particular direction on a perfectly smooth surface, then no force is acting on it. True or false? Explain.

Q8. Gravitational force exists between you and a building. Why are you not pulled towards the building?

Q9. Why do you think it is necessary to define a separate quantity called pressure? Why is defining only force not enough?

Q10. Identify the forces that come into play in the following cases:

1. Jumping on the floor

ANSWER

Select the correct Answer

1. Friction
2. The pressure doubles.

Pressure (P) = Force (F)/Area (A)
= 10 N / 0.1 m^2 = 100 N/m^2
= 100 Pa
Now, according to the question,
New area, A' = A/2 and F' = F
∴ P' = F'/A' = 2F/A = 2P
= 2 × 100 = 200 Pa
Thus, the pressure gets doubled.

3. Presure = Force / Area
   = 30/120cm^2 = 30 / 120/100x100m^2 = 30 x 10000/ 120m^2 = 2500m^2 = 2.5 X 10^3 N/m^2

Answer the following questions

Ans1. The pressure under a liquid surface varies with depth. As depth increases, pressure increases. Thus, when a bubble rises from below the surface it encounters less pressure. This causes the volume to increase and the bubble rises in size as it rises from a depth.

Ans2. It is easier to hammer a sharp nail than a blunt one into the wood. This is because blunt nail occupies more area than sharper nail. As pressure exerted it inversely proportional to area lesser the area, the pressure will be more. So the sharp will exert more pressure as it occupies less area.

Ans3. True. [Push or pull acting on a body are called force. The direction in which an object is pushed or pulled is called the direction of the force.]

Ans4. False. [When we apply the brakes to slow down a bicycle it will not move forward. Thus, the bicycle will move in the opposite direction of the applied force.]

Ans5. lesser

Ans6. Pressure exerted by a liquid increases with depth and acts in all directions.

Ans7. False. If no external force is applied on the body, then there must be two equal and opposite forces acting on the body. Both these forces add up to zero.

Ans8. The magnitude of gravitational force depends on the masses of two objects and the distance between them.
Gravitational force generally felt between objects of greater masses. Since mass of building and our body smaller as compared to the earth, we are not pulled towards the building.

Ans9. It is necessary to define pressure as a separate quantity to find the impact of force on a surface.
As we know that the impact of force depends on both the amount of force applied and the area over which it is applied. So, only force is not enough for this purpose.

Ans10. 1. When we jump on the floor, the gravitational force is acting on our body which makes us to land on the floor. Also the frictional force between our foot and the floor prevents us from falling down.