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Force & Pressure Worksheet — Answer Key

2026 – 2027

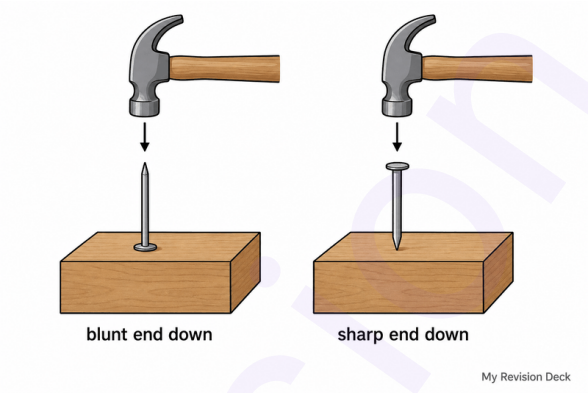
Grade: 8 **Subject:** Physics

Time: 15 minutes **Maximum Marks:** 15

Section A

1. **Choose the correct answer**

(i) The image shows two identical hammers striking two nails with equal force — one nail is held with its flat blunt end on the wooden block, while the other is held with its sharp end on the block. Which nail enters the block, and why? [1]



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(a) Sharp end gives greater thrust for the same pressure

(b) Blunt end gives greater pressure for the same thrust

(c) Sharp end gives greater pressure for the same thrust

(d) Sharp end gives less pressure, so the wood gives way

Explanation: *The thrust from the hammer is the same on both nails. The nail on its sharp end has a very small area of contact with the block, so pressure (= thrust / area) is much larger, driving the nail in easily. The nail on its flat end has a larger contact area and produces much less pressure, so it does not penetrate.*

(ii) Assertion (A): The water pressure at the bottom of a narrow pipe filled with water to a height of 2 m is greater than at the bottom of a wide tank filled with water to a depth of 1 m. [1]

Reason (R): The pressure of a liquid at a point depends on the volume of the liquid in the container.

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are 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

Explanation: *Liquid pressure depends on the height of the liquid column above the point and on the density of the liquid, not on the volume of liquid or the width of the container. The pipe has a taller column of water (2 m), so the pressure at its bottom is greater, regardless of which container holds more water. A is true, but R is false.*

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2. **Fill in the blank**

The net upward force experienced by a body immersed in a liquid, arising from the greater pressure on its bottom than on its top, is called _____. [1]

buoyant force

Explanation: *When a body is immersed in a liquid, the difference in pressure between its bottom and top surfaces produces a net upward force, called buoyant force or upthrust.*

3. **Name the following**

Name the cause that can change the state of rest or motion of a body, or change its size or shape. [1]

force

4. Define 'Thrust'. [1]

Model answer: Thrust is the force acting on a surface in a direction perpendicular (normal) to the surface.

5. How do you demonstrate that a liquid exerts pressure in all directions? Briefly describe an experiment. [2]

Model answer: Take a balloon, fill it with water, and tie its mouth tightly. Make several pinholes all over the surface of the balloon — top, sides, and bottom. Water spurts out through every hole, in every direction. This shows that the water inside exerts pressure in all directions on the inner walls of the balloon, since otherwise it could not push out through holes facing in different directions.

6. When a force is applied on a body that is pivoted at a point, the body can rotate about the pivot. The turning effect of the force depends on certain factors and is measured by a quantity called the moment of force.

(i) Name the line about which a pivoted body rotates when a force is applied at another point. [1]

Model answer: The body rotates about the vertical line passing through the pivoted point, which is called the axis of rotation.

(ii) Define the moment of a force about a point. [1]

Model answer: The moment of a force about a point is equal to the product of the magnitude of the force and the perpendicular distance of the force from that point.

(iii) State the convention for the sign of moment of a force. [1]

Model answer: By convention, an anticlockwise moment of a force is taken as positive, while a clockwise moment is taken as negative.

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Section B

7. **Solve the following numericals, showing your working**

(a) The thrust on the bottom of a swimming pool of area 200 m² is 1.5 × 10⁶ N. Calculate the pressure on the bottom of the pool in Pa, and the pressure in kPa. [3]

Pressure = 7500 Pa = 7.5 kPa

Model answer: Given:
Thrust F = 1.5 × 10⁶ N
Area A = 200 m²
Formula: Pressure P = F / A
Substitution: P = 1.5 × 10⁶ N / 200 m² = 7500 N m⁻² = 7500 Pa
In kPa: P = 7500 Pa ÷ 1000 = 7.5 kPa
Therefore, the pressure on the bottom of the pool is 7500 Pa (= 7.5 kPa).

(b) A force of 12 N is applied at a perpendicular distance of 0.25 m from a pivoted point. Calculate the moment of force about the pivot. [2]

3 N m

Model answer: Given:
Force F = 12 N
Perpendicular distance d = 0.25 m
Formula: Moment of force M = F × d
Substitution: M = 12 N × 0.25 m = 3 N m
Therefore, the moment of force about the pivot is 3 N m.

********** End of worksheet **********

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