

CLASS VIII SCIENCE | FORCE AND PRESSURE

CHAPTER ASSESSMENT | CBSE-STYLE QUESTION FORMATS

Time: 1 hour 30 minutes

Questions: 25

Maximum Marks: 50

Name: _____ Roll No.: _____ Date: _____

Instructions: All questions are compulsory. Write answers on a separate answer sheet. Show calculations with units. Marks are given in brackets. Label diagrams neatly wherever required. Questions progress from basic to challenging.

SECTION A | OBJECTIVE QUESTIONS

12 × 1 = 12 marks

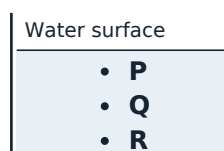
- A push or pull exerted on an object is called: [1]
(A) Energy (B) Speed (C) Force (D) Pressure
 - Which is the SI unit of force? [1]
(A) pascal (B) newton (C) metre (D) second
 - Which force can act without physical contact? [1]
(A) Muscular force (B) Frictional force (C) Magnetic force (D) A hand's push
 - For a fixed perpendicular force, halving the contact area makes the pressure: [1]
(A) Half as much (B) Twice as much (C) Unchanged (D) Zero
 - Fill in the blank:** A force arises from an _____ between two objects. [1]
 - Fill in the blank:** Perpendicular force per unit area is called _____. [1]
 - True or False:** A force can change an object's direction of motion. [1]
 - True or False:** Liquids exert pressure only on the bottom of their container. [1]
 - Match the columns.** Write the two correct pairs. (½ mark each) [1]

Column A	Column B
(i) A released stone falls	(a) Electrostatic force
(ii) A rubbed comb attracts paper	(b) Gravitational force
 - Very short answer:** Name the force that slows a box sliding on a rough floor. [1]
- For Q11-12, choose the correct assertion-reason option:**
 (A) Both A and R are true; R correctly explains A. (B) Both are true; R does not explain A.
 (C) A is true, but R is false. (D) A is false, but R is true.
- Assertion (A):** Broad shoulder straps make a heavy bag more comfortable. [1]
Reason (R): Greater contact area reduces pressure for the same load.
 - Assertion (A):** Magnetic force is a contact force. [1]
Reason (R): A magnet can attract an iron nail without touching it.

SECTION B | SHORT ANSWERS

5 × 2 = 10 marks

- State two different effects of a force on an object. Give one example of each. (1 + 1) [2]
- A girl kicks a football. Name the force used and the two interacting objects. (1 + 1) [2]
- Distinguish contact forces from non-contact forces. Give one example of each. (1 + 1) [2]
- A force of 180 N acts perpendicularly over an area of 0.03 m². Calculate the pressure in pascals. Show your formula. [2]
- The sketch shows water at rest in an open tank. At which marked point is the water pressure greatest? Give a reason. (1 + 1) [2]



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Continue answering on your answer sheet. Give reasons wherever asked.

Q18-25 | 28 marks

SECTION C | APPLICATION QUESTIONS

4 × 3 = 12 marks

- 18.** A crate is pushed with 80 N to the right and 55 N to the left. Ignore friction. Find the net force with its direction, then state the extra force needed for zero net force. **(2 + 1)** **[3]**
- 19.** Two identical bricks are placed gently on sand: one broad face down, one narrow face down. Which sinks deeper? Explain using weight, contact area and pressure. **(1 + 2)** **[3]**
- 20.** A child uses a hand pump to inflate a balloon. Name the force used to push the pump handle. Explain why the balloon expands as more air enters it. **(1 + 2)** **[3]**
- 21.** Explain how pushing out air helps a rubber suction cup stick to smooth glass. Why does the cup loosen when air leaks underneath? **(2 + 1)** **[3]**

SECTION D | CASE-BASED QUESTIONS

2 × 4 = 8 marks

22. Protecting the floor **[4]**

A box presses vertically on a horizontal floor with a force of 240 N. It can rest in three orientations. Assume the force is spread evenly over each contact area.

Orientation	A	B	C
Contact area (m ²)	0.12	0.06	0.03

- (a) Calculate the pressure in orientation A. **(1)**
- (b) Which orientation produces the greatest pressure? **(1)**
- (c) The floor can tolerate at most 3,000 Pa. Which orientation(s) are safe for it? Justify with calculations. **(2)**

23. How a dropper works **[4]**

A student squeezes the rubber bulb of an empty dropper, places its tip under water, and releases the bulb. Water rises into the tube.

- (a) What is pushed out when the bulb is squeezed? **(1)**
- (b) Explain why water rises by comparing the pressures inside and outside the dropper. **(2)**
- (c) What enters the tube if the bulb is released with the tip above water? **(1)**

SECTION E | LONG ANSWERS AND REASONING

2 × 4 = 8 marks

- 24.** A heavy box is pushed to the right but stays at rest on a rough, horizontal floor. A student says, "No force acts because the box does not move." Draw a labelled sketch of the two horizontal forces. Explain why the claim is wrong, why the box remains at rest and what must happen for sliding to begin. **(2 + 1 + 1)** **[4]**
- 25.** A crate exerts a downward force of 600 N through a base of area 0.04 m². The floor can tolerate a maximum pressure of 10,000 Pa. Assume loads are spread evenly. **[4]**
 - (a) Calculate the pressure and decide whether the floor can safely support the crate. **(2)**
 - (b) A light board of area 0.10 m² is placed under the crate to spread its load. An extra load of 400 N is then added. Is the pressure now within the limit? Show your calculation. Ignore the board's weight. **(2)**