SCHOOL: Your school name

SENIOR TWO PHYSICS · UNIT 4 HOMEWORK

Pressure in Solids and Liquids · FREE SAMPLE

Academic year: 20…… – 20…… **Date:** ……/……/20……

Name: …… Class: ……

Duration: Take-home **Total marks:** 19

INSTRUCTIONS

1. Answer ALL questions.
2. Show your working for calculations and give units.
3. This free sample is a short extract. A full homework sheet has 25 marks.

PART 1: OBJECTIVE QUESTIONS

Write the letter, True or False or the missing word, match the items, and fill in the blanks. The marks are shown for each question.

1. The pressure at a depth h in a liquid of density ρ is given by: (1 mark)

A. $P = h/\rho g$
B. $P = \rho g/h$
C. $P = h\rho g$
D. $P = \rho/gh$

2. On Lake Muhazi the atmospheric pressure is 88 kPa (water 1000 kg/m³, g = 10 N/kg). At what depth is the total pressure twice the atmospheric pressure? (1 mark)

A. 17.6 m
B. 88 m
C. 8.8 m
D. 0.88 m

3. A camel's wide feet exert a smaller force on the sand than the narrow hooves of a donkey of the same weight. *(True / False)* (1 mark)

4. In a hydraulic press, the larger output force acts on the piston with the larger _____. (1 mark)

5. A cow of weight 2000 N stands on soft ground and exerts a pressure of 50 000 Pa. The total area of its hooves touching the ground is _____ m². (1 mark)

6. Matching. Match each item in column A with the correct answer in column B. Write the letter in the answer column. (4 marks)

Column A	Answer	Column B
1. Which liquid gives the greatest pressure at a depth of 10 cm?		**a.** Force per unit area

2. In a liquid at rest, all points at the same horizontal level are at:		**b.** 100 000 Pa
3. Pressure is defined as:		**c.** Mercury (13 600 kg/m³)
4. A diver goes from 2 m to 12 m deep in water (ρ = 1000 kg/m³, g = 10 m/s²). By how much does the water pressure increase?		**d.** The same pressure

7. Fill in the blanks. Use the words in the box to complete the sentences. One word in the box is not needed. (3 marks)

pressure · **its side face only** · **its smallest face** · **pressure increases with depth**

(i) Water spurts furthest from the lowest hole in a tall tin because ..... .

(ii) The same brick is placed on the floor in three ways. It exerts the greatest pressure when resting on ..... .

(iii) Force acting normally per unit area is called ..... .

PART 2: SHORT ANSWERS

Answer in full sentences.

8. A 60 kg learner (g = 10 N/kg) first stands on one foot of sole area 150 cm², then lies flat on a mat with a contact area of 0.5 m². How many times smaller is the pressure when she lies down? (2 marks)

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9. A box of weight 600 N rests on a face of area 1.5 m². What pressure does it exert on the floor? (2 marks)

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10. State whether this statement is true or false, and give a reason: "Tilting the tube of a mercury barometer changes the vertical height of the mercury column above the dish." (2 marks)

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PART 3: STRUCTURED PROBLEM

Show your working and give units.

11. Pressure in Solids and Liquids **(8 marks)**

(a) A student measures the pressure due to a liquid at three depths: 1200 Pa at 0.1 m, 2400 Pa at 0.2 m and 3600 Pa at 0.3 m ($g = 10\ m/s^2$). What do the results show? (4 marks)

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(b) In a hydraulic lift, $F_1/A_1 = F_2/A_2$. A 50 N force on a 2 cm^2 piston lifts a load on a 200 cm^2 piston. What is the load? (4 marks)

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END