

GIDEONS ELITE BOYS CENTRE OF EXCELLENCE
DECEMBER SELF-ASSESSMENT EXAMINATIONS
FORM ONE

Term 3- 2024
PHYSICS (232)
FORM ONE (1)
Time: 2 Hours

Instructions to Candidates

- Write your name, admission number, class and signature in the spaces provided at the top of the page.
- Answer **ALL** the questions in the spaces provided.
- All work **MUST** be clearly shown.
- This paper consists of 7 printed pages.
- Candidates should answer the questions in English and check to ensure that no question(s) is missing.

FOR EXAMINER'S USE ONLY

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1-18	70	

SECTION A (25 MARKS)

Answer all the questions in this section in the spaces provided

1. The mass of a bucket containing sand was found to be 12 kg. If the volume of the sand was 2900cm^3 and that the mass of empty bucket was 0.3 kg, find the density of sand.

(2 mks)

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2. Figure 1 (a) shows a steel needle resting on water surface:

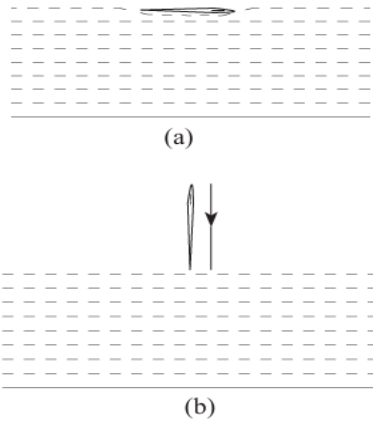


Figure 1

- (i) What makes the needle to float in (a)? (1 mark)

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- (ii) Explain what would happen if the needle was placed vertically on the water surface as in figure (b). (2 marks)

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3. The pressure at the top of a mountain is found to be 700 mmHg. Calculate the height of the mountain given that the density of mercury is 13600 kg/m^3 , density of air 1.25 kg/m^3 and the pressure at sea level is 760 mmHg. ($g = 10 \text{ N/kg}$) (2 marks)

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4. Two samples of bromine vapor are allowed to diffuse separately under different conditions: one in a vacuum and the other in air. In which of the conditions will bromine diffuse faster? (1 mark)

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5. The figure 2 below shows the flame of bunsen burner immediately after being lit from above the gauze:

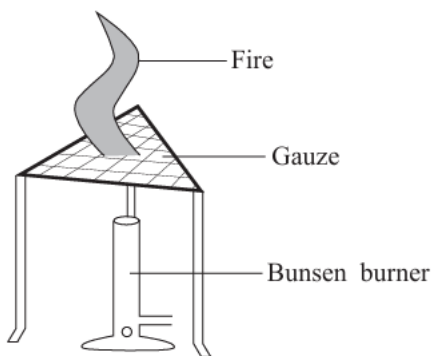


Figure 2

Explain why it takes some time before the flame crosses to the region below. (2 marks)

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6. In the figure 3 below, state the resultant force on the body: (2 marks)



Figure 3

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7. The figure 4 below shows a set-up for investigating the thermal expansion of water:

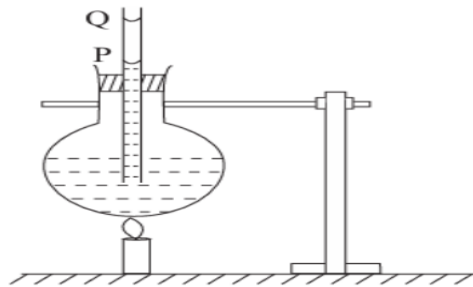


Figure 4

The level of water in the tube initially falls slightly before it rises from P to Q. Explain.

(2 marks)

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8. State two factors considered when choosing a thermometric liquid. (2 marks)

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9. What is meant by Brownian motion? (1 mark)

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10. State two factors that determine pressure in a liquid at a particular place. (2 marks)

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11. State the advantage of using a density bottle instead of a measuring cylinder in determining density. (1 mark)

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12. The figure 5 below shows two blocks A and B placed against a sphere on a meter rule:

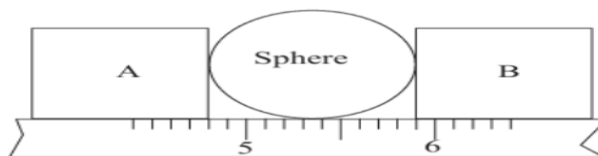


Figure 5

Determine the radius of the sphere. (2 marks)

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13. In an experiment to determine the density of certain solid B, the following readings were obtained using a density bottle;

Mass of empty density bottle = 9 g

Mass of the density bottle + solid B = 99 g

Mass of the density bottle + Water = 88 g

Calculate the density of solid B. (Take density of water to be 1 g/cm^3) (3 marks)

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SECTION B (45 MARKS)

Answer all the questions in this section in the spaces provided

14. The diagram shows different states of matter:

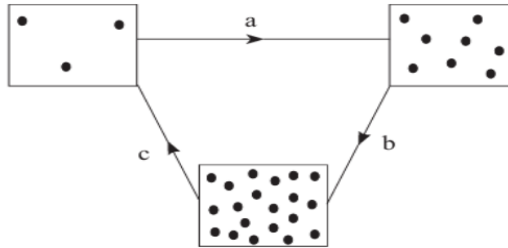


Figure 6

(a) Name the process occurring at:

A: _____

B: _____

C: _____ .

(3 marks)

(b) In another experiment, the volume of a fixed mass of water was measured at various temperatures between 0°C and 10°C .

(i) Sketch a graph of volume against temperature that would be obtained.

(2 marks)

(ii) On the graph, mark using letter X the point where water has the highest density. (1 mark)

(iii) State one advantage of the property of water illustrated in the diagram in (ii) above. (1 mark)

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15. The figure shows a hydraulic lift. The area of the smaller piston B is 8cm^2 while that of piston A is 440cm^2 .

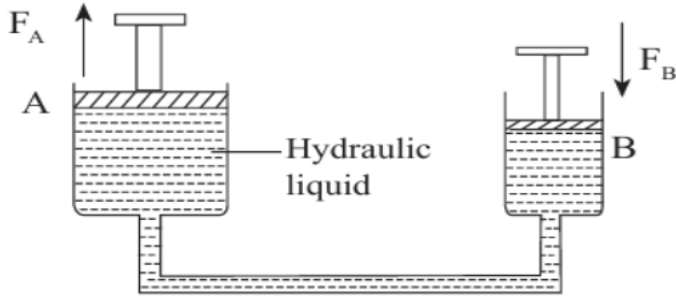


Figure 7

A force F_B is applied on piston B and this generates an upward thrust on piston A.

(a) State why a gas cannot be used in place of the hydraulic liquid. (2 marks)

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(b) Express the force F_A in terms of F_B . (3 marks)

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(c) Calculate the maximum load that can be lifted by piston A when a force of 120 N is applied on B. (3 marks)

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16. The motion of smoke particles enclosed in a smoke cell can be studied using the set-up shown below:

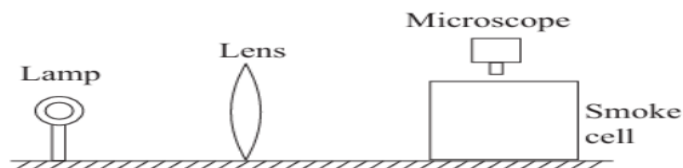


Figure 8

(a) Draw a diagram to show how the smoke particles appear under the microscope. (2 marks)

(b) (i) Explain what happens in the smoke cell. (2 marks)

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(iii) What is the purpose of the microscope and lens? (2 marks)

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(c) State two factors that affect the motion of the particles in the smoke cell. (2 marks)

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(d) Explain why solids have a definite shape but liquids take the shape of the container in which they are put. (2 marks)

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17. (a) Define pressure and give its SI units.

(2 marks)

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(b) (i) State the principle of transmission of pressure in liquids.

(1 mark)

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(ii) State three important properties of the fluid used in the hydraulic system. (3 marks)

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(c) The figure 9 below shows a U-tube with gas trapped at one end by a liquid of density 1400 kg/m^3

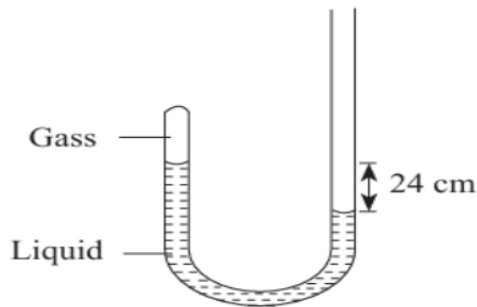


Figure 9

Given that atmospheric pressure is 103000 N/m^2 , determine the gas pressure.

(3 Marks)

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18. The weight of a 16 kg object is 80 N on a certain planet.

(a) Find the gravitational field strength on the planet. (2 marks)

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(b) If an object weighs 140 N on the planet, find its mass. (2 mark)

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(c) Two metals X and Y welded together are heated so that they break the contact shown at P in the figure.

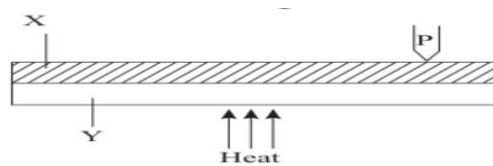


Figure 10

Explain how the contact is broken. (2 marks)

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(d) The figure 11 shows an electric hot plate being used to heat a sauce pan containing water.

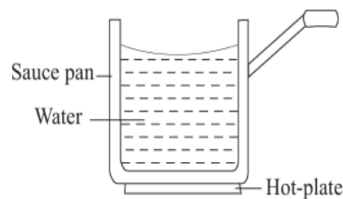


Figure 11

(i) By what method is the heat transferred through the pan? (1 mark)

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(ii) Explain why plastic is used as material for the handle. (1 mark)

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(iii) Explain how water gets heated to the point of boiling. (2 marks)

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