

NAME Marking Scheme ADM NO..... CLASS.....

232/1
Physics
Paper 1
March/April 2018
Time: 2hours

MOKASA JOINT EXAMINATION
Kenya Certificate Secondary Education
K.C.S.E

Instructions to the candidates;

- Write your name, class and admission number in the spaces provided above.
- This paper consists of TWO sections: Sections A and B.
- Answer ALL the questions in sections A and B in the spaces provided.
- ALL working MUST be clearly shown.
- KNEC Mathematical tables and Non-programmable electronic calculators may be used.
- Candidates should check the questions paper to ascertain that all the pages are printed as indicated and that no questions are missing.

Take; $g = 10\text{N/kg}$

Section	Question	Maximum Score	Candidate's Score
A	1-8	25	
B	12	08	
	13	08	
	14	12	
	15	09	
	16	07	
	17	11	
		Total Score	80

SECTION A (25 MARKS)

1. The vernier calipers has a negative error of 0.03cm. A student used such a vernier calipers to measure the diameter of a test tube and read 3.25cm.

a) Sketch the vernier calipers reading 3.25cm. (2 marks)



b) Determine the diameter of the test tube. (1 mark)

$$D = 3.24 + 0.03 = 3.28 \text{ cm}$$

2. Explain why a man using a parachute falls through air slowly while a stone falls through air very faster. (2 marks)

⇒ Parachute has large surface area thus more air @ resistance making it fall slowly. Compare to stone, with small surface area and minimal air resistance. OR
 ⇒ Upthrust in Parachute is higher than in Upthrust due to stone because parachute displaces more air than stone.

3. In an experiment to determine Brownian motion in liquids pollen grains were suspended in water as shown in **Figure 1**. and its movement observed using a hand lens.

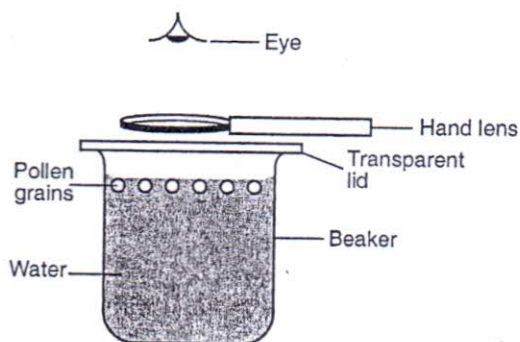


Figure 1.

State and explain the motion of the pollen grains. (2marks)

Pollen grains are seen to be in constant random motion since they are being knocked by invisible water molecules.

4. Figure 2. Shows a simple form of a diving board

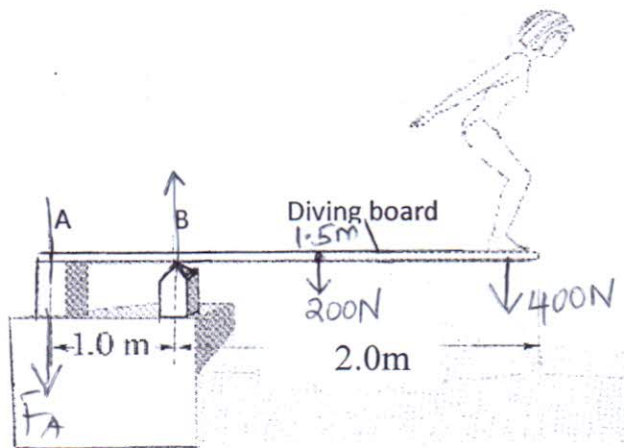


Figure 2.

The diver has a mass of 40kg. Calculate the magnitude of force acting at A and B if the board is uniform and has a mass of 20 kg (4 marks)

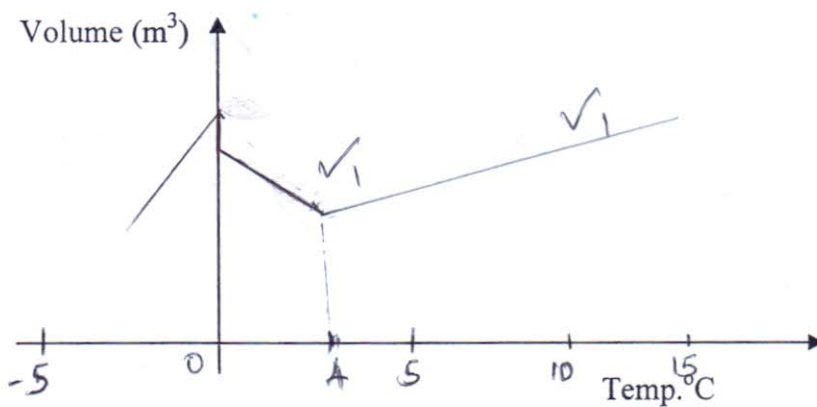
.....
 Taking Moment at B C.M \rightarrow A-M

 $(F_A \times 1) = (200 \times 0.5) + (400 \times 2)$ ✓

 $F_A = 100 + 800 = 900 \text{ N}$ ✓

 $F_B = \text{Reaction at B} = 900 + 200 + 400 = 1500 \text{ N}$ ✓

5. Ice is heated from a temperature of -5°C to water at 15°C . Sketch a graph on the axes below to show the variation of its volume with temperature. (2 marks)



6. A solid copper sphere will sink in water while a hollow copper sphere of the same mass may float. Explain this observation. (2 marks)

Solid copper is denser than hollow copper, hence sinks, while hollow sphere contains air which enables it to displace more water increasing upthrust making it float.

7. **Figure 3.** shows a Bunsen burner

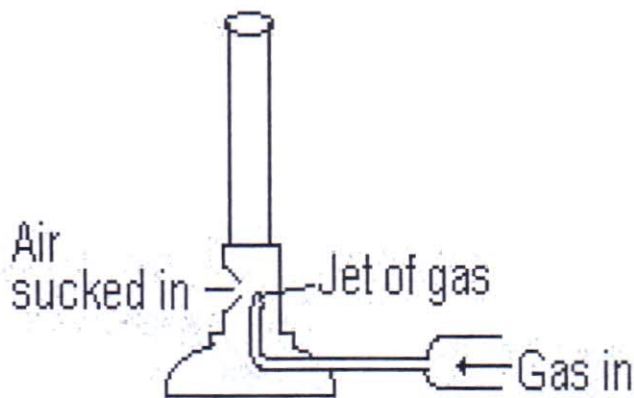
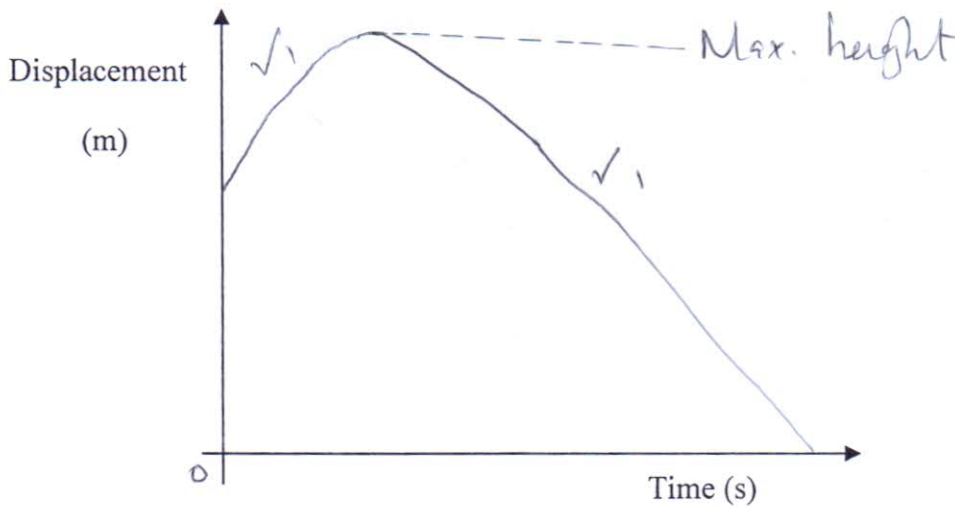


Figure 3.

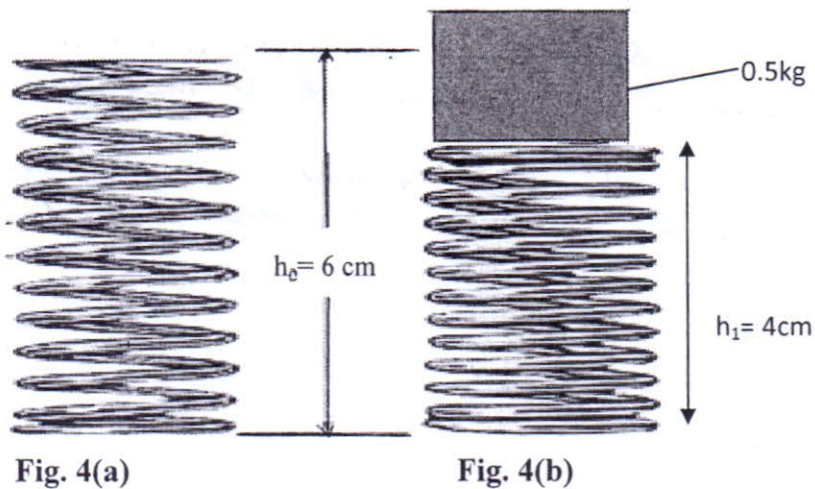
- Explain how air is drawn into the burner when the gas tap is opened. (2 marks)

- The gas comes out of the gas jet at a high velocity, decreasing pressure inside.
- Atmospheric pressure outside near the air hole is higher than pressure inside, forcing air into the chimney.

8. A stone is thrown vertically upwards with a velocity u from the top of a cliff of height 20m falls to the ground below. Take the ground as the zero level, sketch a displacement-time graph in the axes below. (2 marks)



9. The **figure 4. (a)** below shows a spring fixed on a bench vertically. A mass of 0.5kg is placed on top as shown in **Figure 4.(b)**.



In (a) the height h_0 of spring is 6cm while in (b), the height $h_1 = 4$ cm. Calculate the energy stored in the spring in (b). (3 marks)

$$\begin{array}{l}
 e = 6 - 4 = 2 \text{ cm} \quad \checkmark \\
 F = k e \\
 k = \frac{F}{e} = \frac{5}{0.02} \quad \checkmark \\
 = 250 \text{ N/m} \\
 E = \frac{1}{2} k e^2 \\
 = \frac{1}{2} \times 250 \times (0.02)^2 \\
 = 0.05 \text{ J} \quad \checkmark
 \end{array}$$

