

232/1

KENYA NATIONAL EXAMINATIONS COUNCIL  
Kenya Certificate of Secondary Education**PHYSICS (Theory)**

Nov. 2024 – 2 hours

Paper 1

Candidate's signature: ..... Date: .....

**Instructions to Candidates**

- (a) Confirm that this question paper has your name and the correct index number.
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- (d) Answer **all** the questions in sections **A** and **B** in the spaces provided.
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- (f) Non-programmable silent electronic calculators may be used.
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**For Examiner's Use Only**

| Section            | Questions | Maximum Score | Candidate's Score |
|--------------------|-----------|---------------|-------------------|
| <b>A</b>           | 1 - 13    | <b>25</b>     |                   |
|                    | 14        | <b>10</b>     |                   |
|                    | 15        | <b>10</b>     |                   |
|                    | 16        | <b>10</b>     |                   |
|                    | 17        | <b>13</b>     |                   |
|                    | 18        | <b>12</b>     |                   |
| <b>Total Score</b> |           | <b>80</b>     |                   |

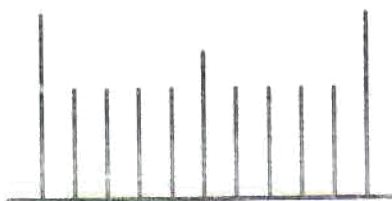


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**SECTION A (25 marks)**

*Answer all the questions in this section in the spaces provided.*

- 1 **Figure 1** shows the vernier scale of a vernier calliper.



**Figure 1**

On the figure, include the main scale so that the vernier calliper shows a reading of 3.5 cm.

(2 marks)

- 2 Explain why weight of an object is a vector quantity.

(1 marks)

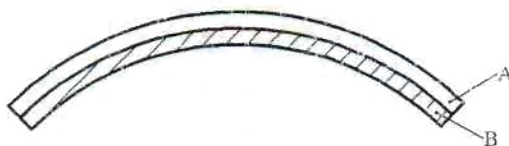
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**Figure 2**

State the reason why the strip appears as shown.

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- 4 It is observed that in order to balance a sea-saw, the heavier child sits closer to the pivot. State the reason for this observation. (2 marks)

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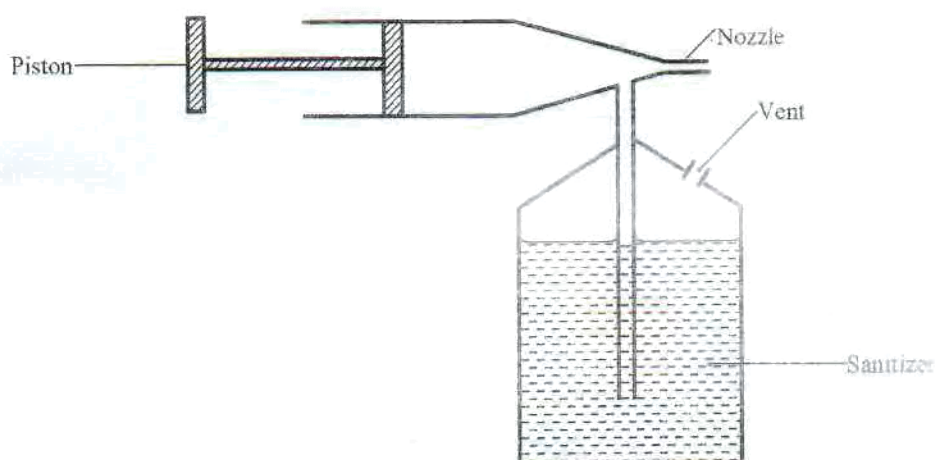
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- 6 **Figure 3** shows a simple hand sanitizer dispenser.



**Figure 3**

Explain how it works. (3 marks)

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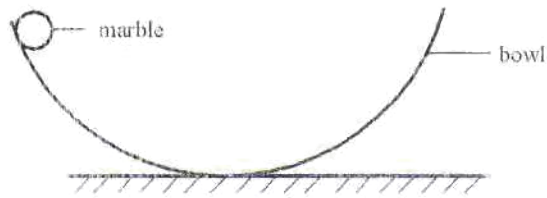
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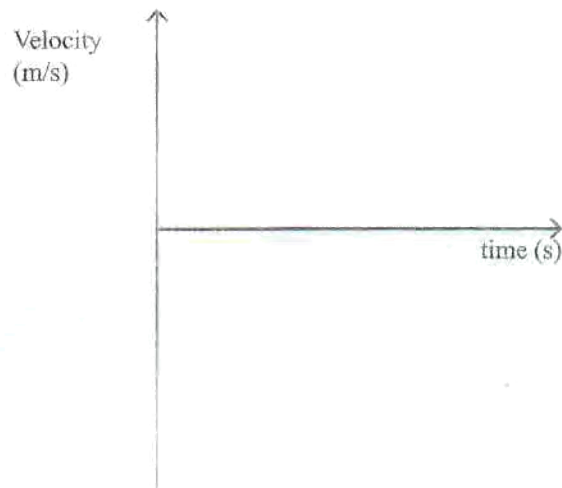


- 7 **Figure 4** shows a marble that is set into oscillations when released in a bowl.



**Figure 4**

On the axes provided, sketch the velocity-time graph for the motion of the marble in one complete oscillation. (3 marks)



- 8 State the meaning of the term *viscosity* as used in fluids. (1 mark)

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- 9 A machine raises a mass of 20 kg through a distance of 0.2 m when an effort of 100 N is moved through a distance of 0.32 m. Determine the velocity ratio of the machine. (2 marks)

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- 10 A gas bubble is released at the bottom of a pond containing water. It is observed that as the bubble rises to the water surface, it expands. Explain this observation. (2 marks)

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(a) causes this motion; (1 mark)

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(b) happens to the motion of the particles if the temperature in the cell is increased. (1 mark)

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## SECTION B (55 marks)

Answer *all* the questions in this section in the spaces provided.

- 14 (a) (i) State the meaning of the term *relative density*. (1 mark)

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- (ii) State **two** areas of application of relative density in daily life. (2 marks)

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- (b) A student blew air into a balloon, tied it up and released it into the air. It floated for some time but slowly descended to the ground and settled.

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- (c) A hollow metallic cube of volume  $1000 \text{ cm}^3$  is submerged in a liquid of density  $1100 \text{ kgm}^{-3}$ . Determine the upthrust acting on it. (*take  $g$  as  $10 \text{ Nkg}^{-1}$* ) (3 marks)

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- (c) A student was provided with a piece of wire and asked to make a spring. After coiling the wire on a rod, the spring appeared as shown in **figure 5**.

14



Figure 5

State **two** ways in which the student can modify the spring to make it stiffer.

(2 marks)

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- 16 (a) **Figure 6** shows a set up that may be used to determine acceleration due to gravity.

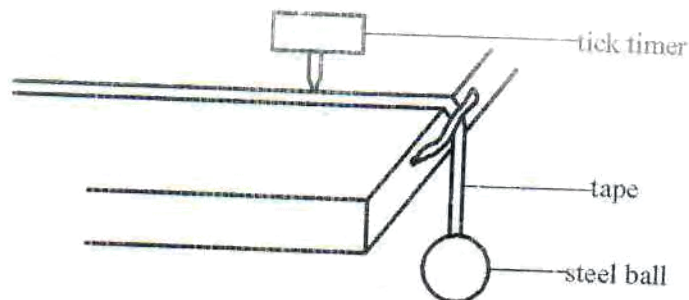


Figure 6



Describe how the set up may be used to determine the acceleration due to gravity. (4 marks)

rks)

rks)

- (b) A stone of mass 0.02 kg tied at the end of a string is whirled in a vertical circle of radius 1.0 m. Determine the minimum velocity required for the stone to maintain circular motion. (*acceleration due to gravity  $g$  is  $10 \text{ ms}^{-2}$* ). (4 marks)

- (c) State **two** applications of centripetal force. (2 marks)

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- (a) It is observed that when salt is sprinkled onto the surface of ice at  $-2^\circ\text{C}$ , the ice melts. Explain this observation. (2 marks)



- (b) State **two** factors that determine the pressure exerted by solids. (2 marks)

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- (c) (i) A person mixed 2 kg of hot water at  $70^{\circ}\text{C}$  with 3 kg of cold water at  $22^{\circ}\text{C}$  for bathing. Given that the specific heat capacity of water is  $4200 \text{ J kg}^{-1} \text{ K}^{-1}$ , determine the final temperature of the mixture, assuming there was no heat loss. (3 marks)

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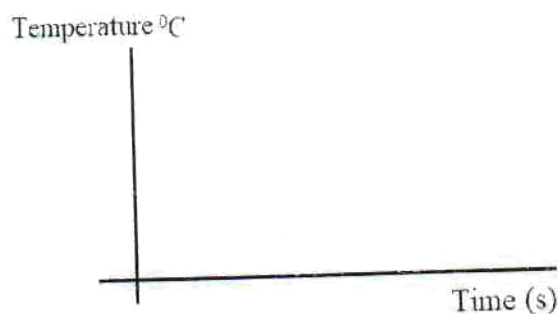
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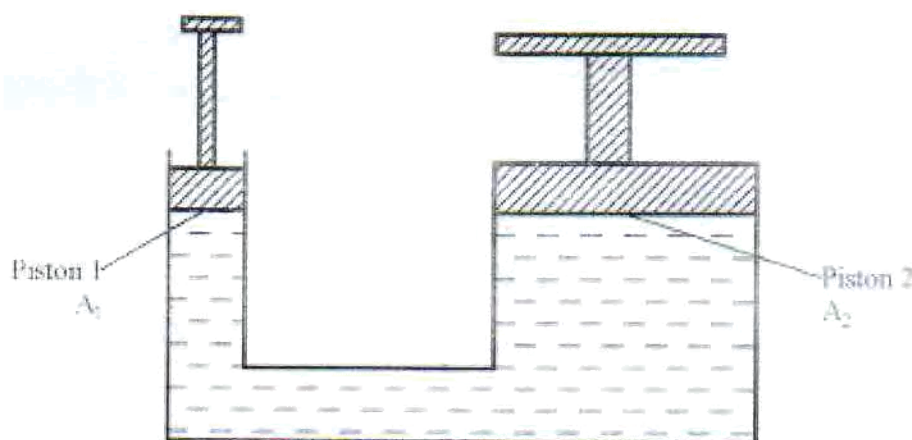


Figure 7

- (i) Given that the areas  $A_1$  and  $A_2$  are  $0.2 \text{ m}^2$  and  $4 \text{ m}^2$  respectively, determine the maximum load that can be lifted at piston 2, when a force of  $200 \text{ N}$  is applied at piston 1. (3 marks)

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NAME: MWANGI FRANCIS MBURU  
 INDEX NUMBER: 27536148113  
 CENTRE CODE: 27536148  
 CENTRE NAME: ANESTER VICTORY BOYS HIGH SCHOOL

000450070-1-67

232/1

Candidate's signature: ..... Date: .....

Random Number: 50854774113

**THE KENYA NATIONAL EXAMINATIONS COUNCIL**  
 Kenya Certificate of Secondary Education

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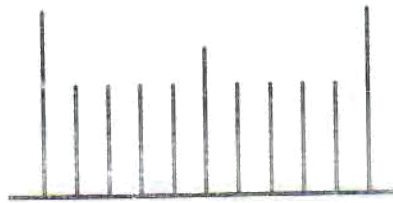
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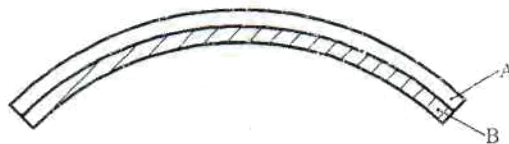
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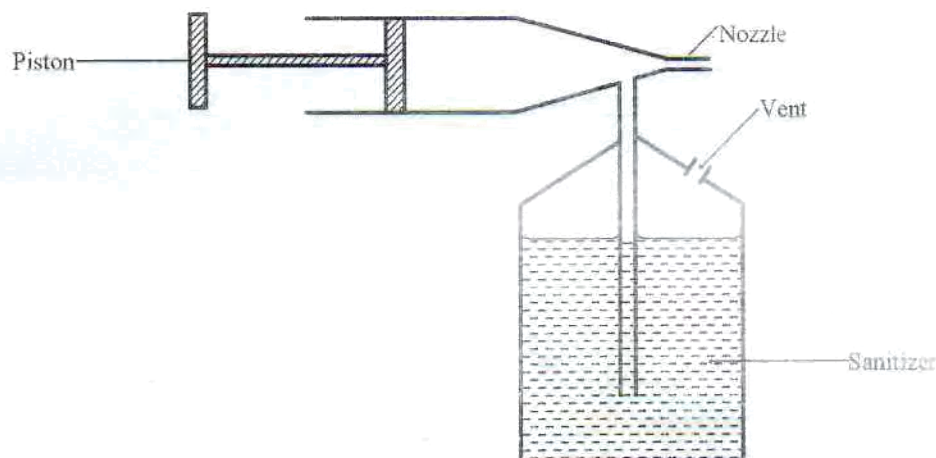
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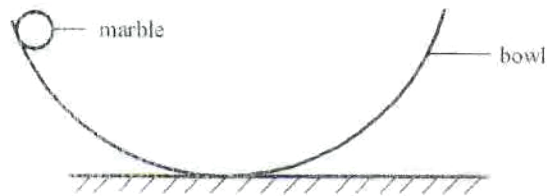
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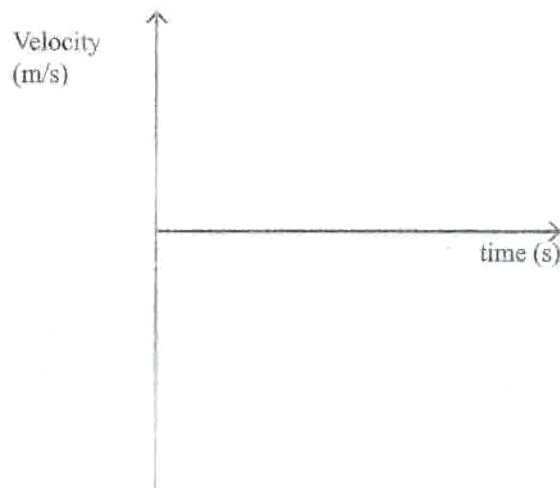


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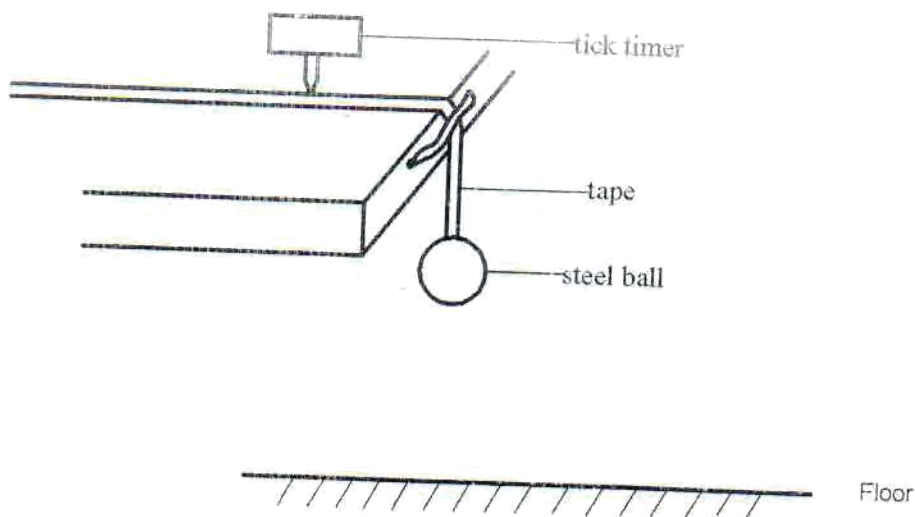
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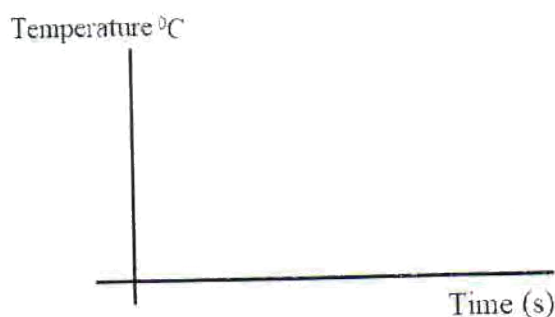
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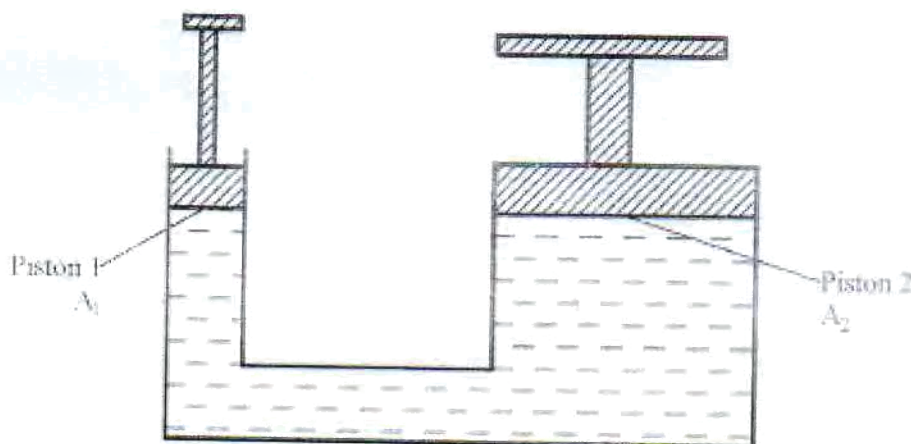


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- (ii) State **two** reasons why water is not a suitable liquid for use in this system.

(2 marks)

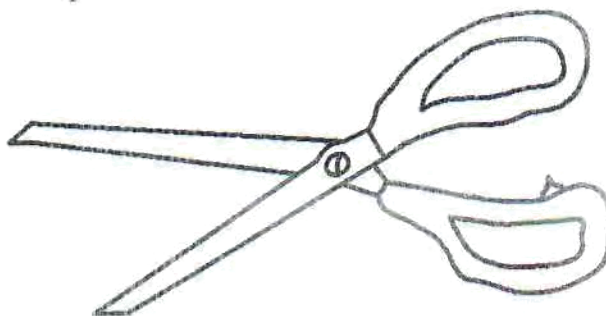
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- (c) **Figure 8** shows a pair of scissors.



**Figure 8**

- (i) On the diagram, label the load, effort and fulcrum.

(1 mark)

- (ii) Explain how the velocity ratio of the given pair of scissors may be reduced.

(2 marks)

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- (iii) State the reason why it is important to minimize the velocity ratio.

(1 mark)

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**THIS IS THE LAST PRINTED PAGE.**

