KING'S ACADEMY

DEPARTMENT OF PHYSICS

Kenya Certificate of Secondary Education

232/1 - PHYSICS (Theory) Paper 1

February 2026

Time 2:00 hours

Name: _____Adm Number: _____

Candidate's Signature: _____ _____ Date: _____

Instructions to candidates

(a) Write your name and index number in the spaces provided above.

(b) Sign and write the date of the examination in the spaces provided.

(c) This paper consists of two sections A and B.

(d) Answer all the questions in sections A and B in the spaces provided.

(e) All working must be clearly shown in the spaces provided in this booklet.

(f) Non-programmable silent electronic calculators may be used.

(g) This paper consists of 12 printed pages.

(h) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

(i) Candidates should answer the questions in English.

For Examiner's Use Only

Section	Questions	Maximum Score	Candidate's Score
A	1–13	25	
B	14	12	
	15	12	
	16	11	
	17	11	
	18	09	
	Total Score	80	

Section A (25 marks)

Answer all questions in this section in the spaces provided.

1. **Figure 1** shows a section of the scales of a Vernier callipers which was used in the measurement of the diameter of a tennis ball.

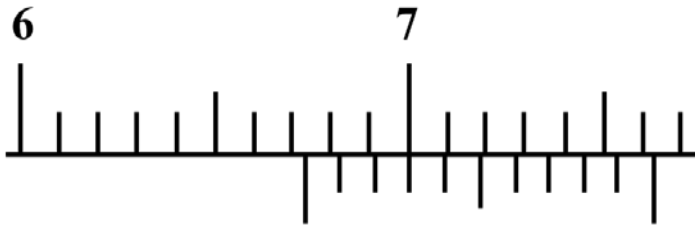

Figure 1

If the actual diameter of the ball was 6.72 cm, determine the zero error of the Vernier callipers.
(2 marks)

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2. **Figure 2** shows an object floating in water contained in a measuring cylinder.

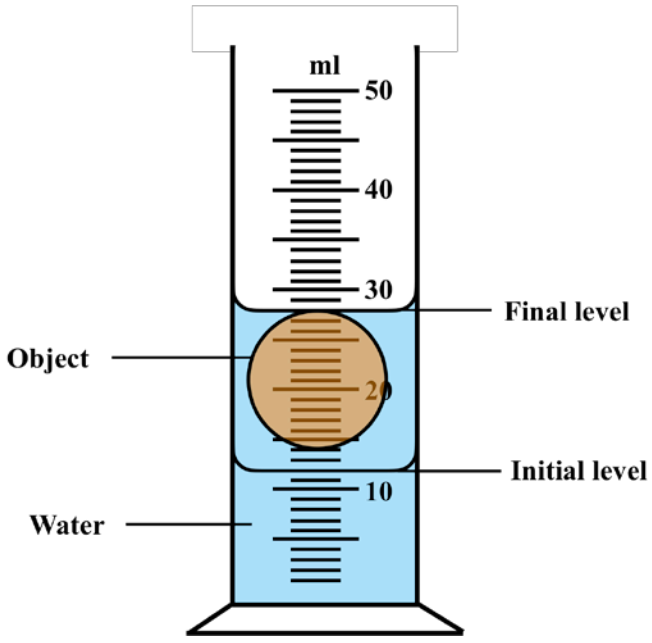

Figure 2

Determine the:

(i) volume of the object, (1 mark)

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(ii) mass of the object. (Take density of water = 1.0 gcm^{-3}). (2 marks)

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3. State **two** differences between natural and forced convection**.** (2 marks)

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4. **Figure 3** shows two capillary tubes A and B of different diameters dipped in mercury.

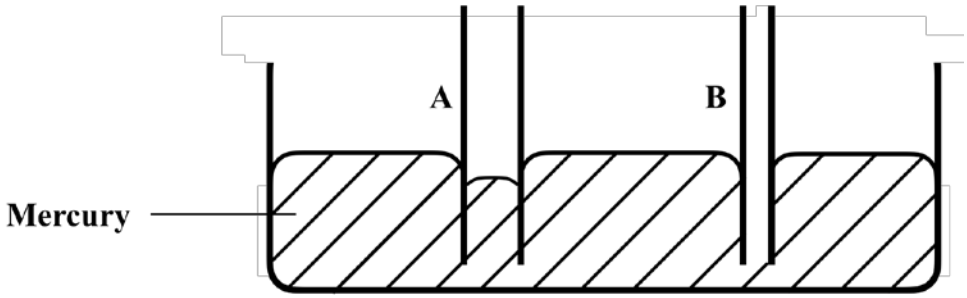

Figure 3

Complete the diagram to show the level of mercury in tube B. (1 mark)

5. State **two** ways of designing a more sensitive liquid-in-glass thermometer. (2 marks)

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6. Explain why oil spread on cold water but not in warm water. (2 marks)

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7. A liquid of mass 200 g in a glass beaker of mass 50 g is balanced on a uniform metre rule as shown in **Figure 4**.

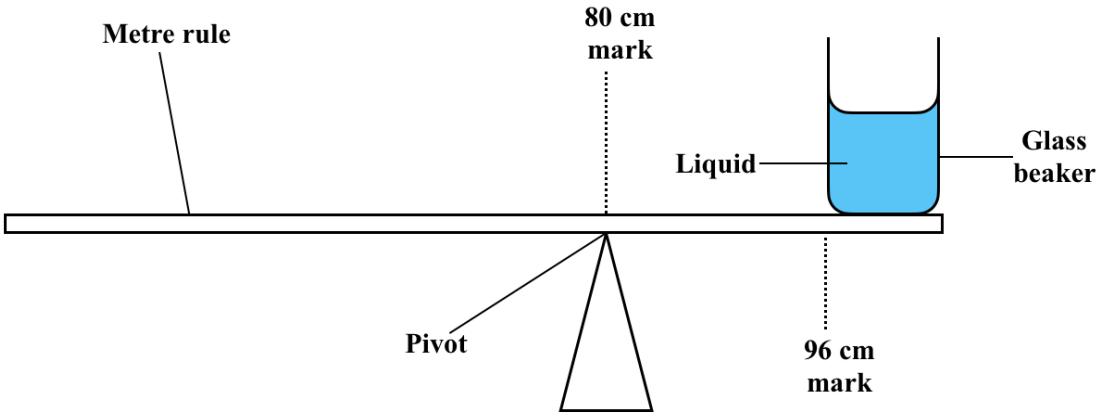

Figure 4

Determine the mass of the metre rule. (Take g = 10 Nkg^{-1}) (3 marks)

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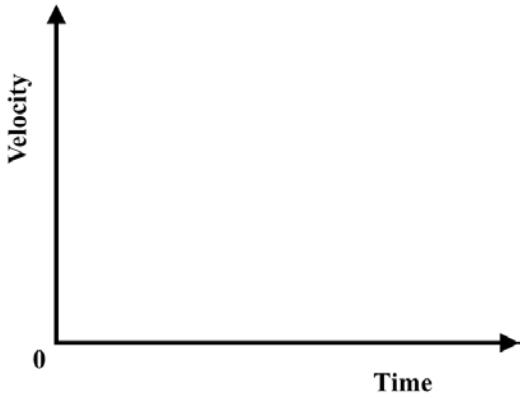
8. A stone is projected vertically upwards. On the axes provided, sketch a velocity-time for its upward motion. (1 mark)



9. State **two** phenomena which show that gas and liquid molecules are in constant random motion. (2 marks)

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10. **Figure 5** shows a box of mass M pulled along a workbench by a constant force F. The box is moving with uniform velocity v

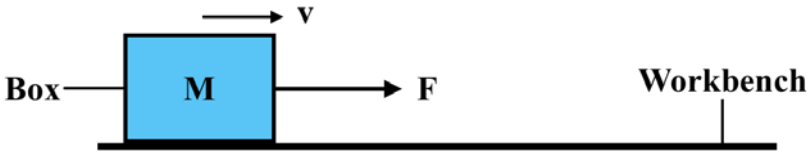

Figure 5

Explain what happens when the pulling force F is doubled. (2 marks)

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11. The velocity of a fluid is observed to reduce when flowing one section of a channel to another. Suggest **two** reasons for this observation. (2 marks)

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12. **Figure 6** shows container, P and Q, filled with equal amounts of water.

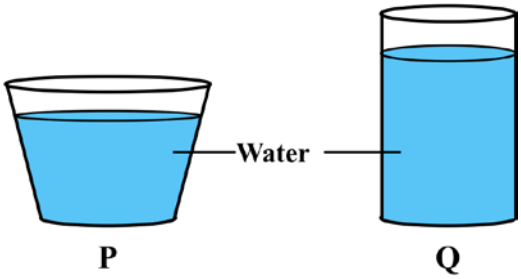

Figure 6

State, with a reason, in which container will water exert more pressure at the bottom. (2 marks)

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13. State why a floating body displaces its own weight (1 mark)

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Section B (55 marks)

Answer all question in this section in the spaces provided.

14. (a) You are provided with the following:

- a spring with a pointer,
- half metre rule,
- 100 g mass
- stand, clamp and boss.

(i) Sketch a labelled diagram of the setup of an experiment to determine the spring constant of the spring. (2 marks)

(ii) State the readings to made. (2 marks)

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(iii) Explain the readings in (ii) above can be used to determine the spring constant of the spring. (3 marks)

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(b) **Figure 7** shows three identical springs supporting a load of 100 N.

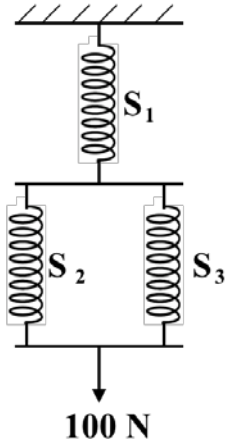

Figure 7

If the extension of spring S_1 is 2.0 cm, determine the effective:

(i) extension of the system, (2 marks)

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(ii) spring constant of the system. (3 marks)

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15. (a) Explain why the efficiency of a block and tackle pulley system cannot be 100%. (2 marks)

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(b) **Figure 8** shows a glass block of mass 1 kg sliding up an inclined plane. The block slide, a distance d, up the incline. Its velocity decreases from 10 ms^{-1} to 0 ms^{-1}.

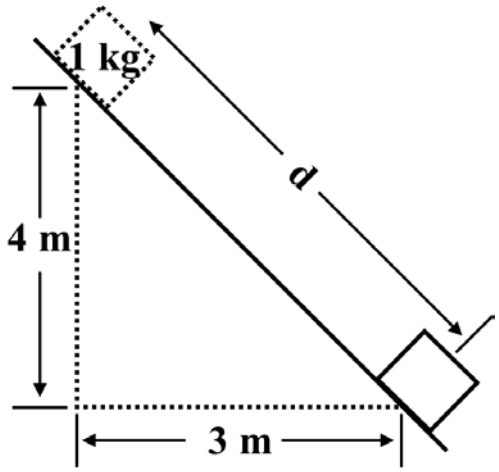

Figure 8

Determine the:

(i) distance d, (2 marks)

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(ii) velocity ratio, (2 marks)

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(iii) work done, (3 marks)

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(iv) friction between the block and surface. (3 marks)

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16. (a) A truck travels on a road for some time. State and explain how the pressure of the air in its tyres change. (4 marks)

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(b) An elastic balloon containing 0.40 m^3 of helium gas at a temperature of 27 ^oC and a pressure of 1.0 x 10^5 Pa is released from the ground. It rises until its volume becomes 0.60 m^3 and the pressure of the gas inside reduces to 0.5 x 10^5 Pa.

(i) Explain why:

I. the balloon rises. (1 mark)

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II. the volume of the balloon increases. (2 marks)

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(ii) Determine the new temperature of the gas. (4 marks)

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17. (a) Two identical pieces of wet clothes P and Q are aired to dry in the same weather conditions. P is aired in an open field and Q in a narrow open corridor with no roof.

(i) State which clothe is likely to dry sooner. (1 mark)

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(ii) Explain your answer in (i) above. (2 marks)

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(b) **Figure 9** shows a graph of temperature against time for a substance of mass 4 kg heated at a constant rate of 100 kilojoules per minute

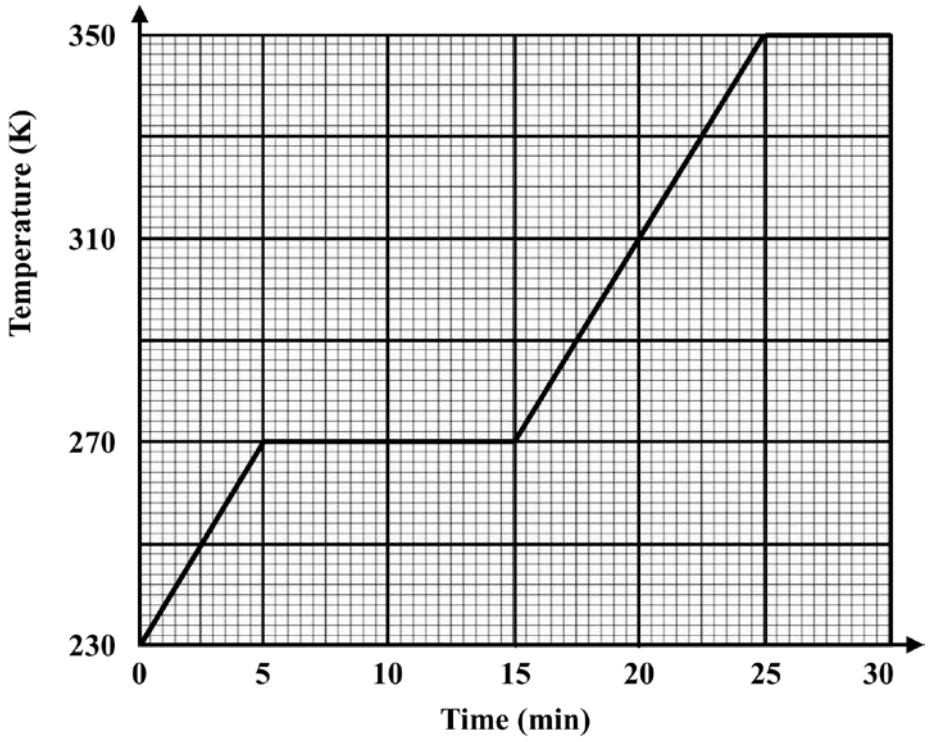

Figure 9

Determine:

(i) the melting point of the substance, (1 mark)

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(ii) the boiling point of the substance, (1 mark)

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(iii) the specific latent heat of fusion of the substance, (3 marks)

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(iv) the specific heat capacity of the substance in its liquid state. (4 marks)

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18. (a) (i) State what is meant by the term *angular displacement*. (1 mark)

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(ii) State the SI unit of angular displacement. (1 mark)

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(b) **Figure 10** shows a car travelling at a constant speed of 80 kmh^{-1} on a dry section of a curved horizontal road. The frictional force between the the tyres of the car and the road is 600 N and the mass of the car together with its load is 600 kg.

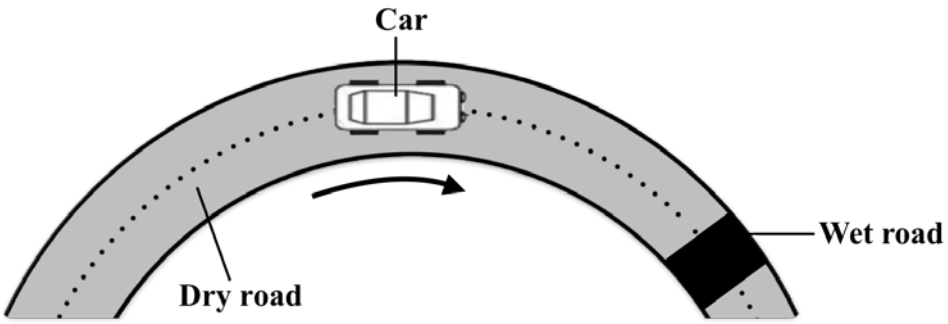

Figure 10

(i) Determine the:

I. centripetal force on the car. (1mark)

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II. radius of the curved road. (4 marks)

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(ii) Explain why the car must slow down for it to succesfully negotiate the wet section of road. (2 marks)

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