

KAPSABET HIGH SCHOOL



232/1 - PHYSICS - Paper 1

2HRS



NAME: ADM NO.: CLASS

CANDIDATE'S SIGNATURE: DATE:

INTERNAL TRIAL 1 2023

Kenya Certificate of Secondary Education (K.C.S.E)

232/1
Physics
Paper 1

INSTRUCTIONS TO THE CANDIDATES:

- Write your **name and index number** in the spaces provided above.
- Answer **all** the questions both in section **A** and **B** in the spaces provided below each question
- All workings **must** be clearly shown; marks may be awarded for correct steps even if the answers are wrong.
- Mathematical tables and silent electronic calculators may be used.

FOR EXAMINERS' USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
SECTION A	1-13	25	
SECTION B	14	11	
	15	15	
	16	08	
	17	07	
	18	14	

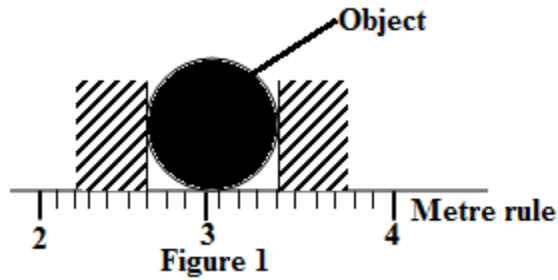
	TOTAL	80	
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This paper consists of 15 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions is missing

SECTION A (25 MARKS)

ANSWER ALL QUESTIONS IN THIS SECTION IN THE SPACES PROVIDED

1. Figure 1 shows an object held between two straight edges. Determine the radius of the object using the meter rule shown in figure 1 below. (2 marks)



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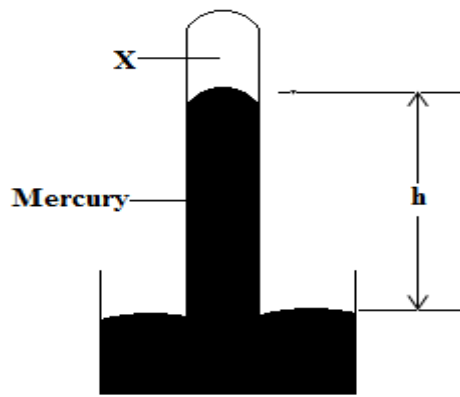
2. Apart from the size of an object state the other factor to be considered when choosing an instrument for measuring length of a given object (1 mark)

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3. The figure shows the level of mercury in a barometer. Study the diagram and answer the questions that follow



State and explain the effect on the height h when the atmospheric pressure increases (2 marks)

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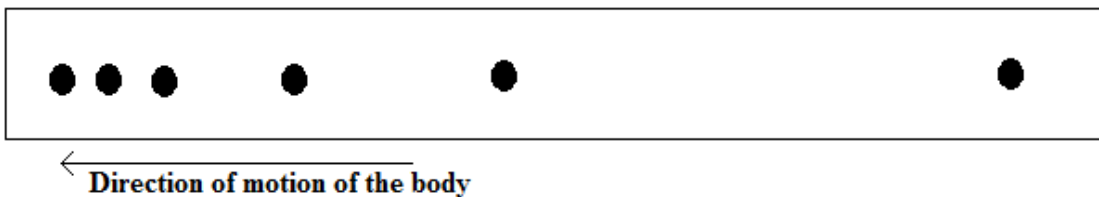
4. Give a reason why it is easier to use a hammer with a long handle to remove a nail from wood than to use another one with a short handle to remove the same nail (1 mark)

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5. When a steel ball is allowed to fall freely in a viscous fluid, it is observed to attain terminal velocity after some time. State the reason why the ball attains terminal velocity (1 mark)

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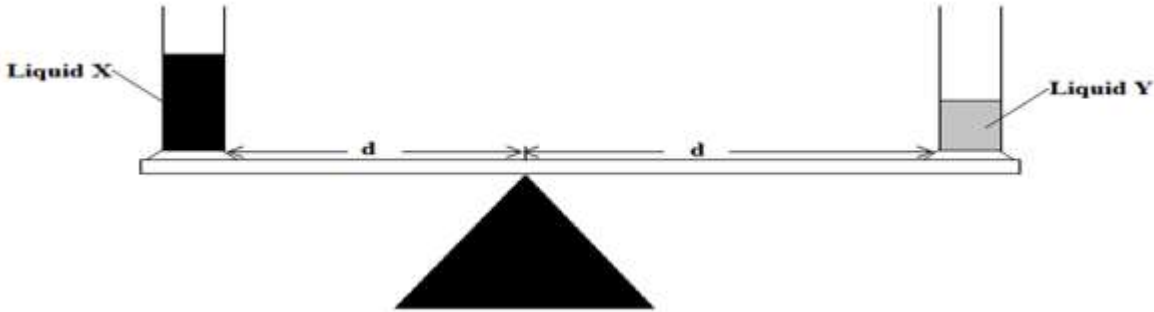
6. The tape in the figure (not to scale) was obtained from an experiment using a timer of frequency 50Hz



State whether the body is decelerating or not the acceleration of the body whose motion is represented in the tape. (1 mark)

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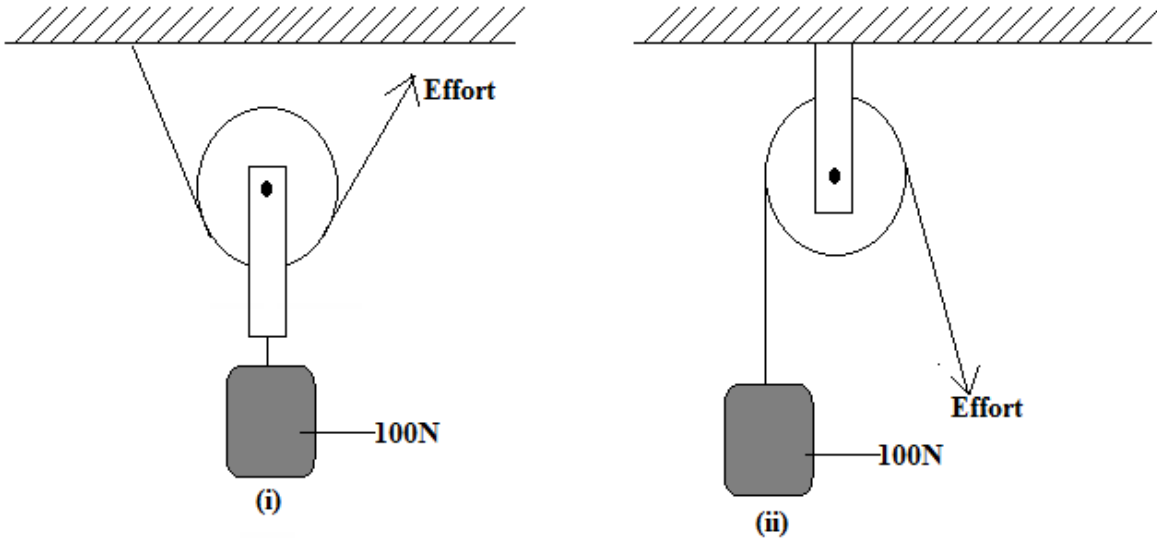
7. The figure shows two identical measuring cylinder containing different liquids X and Y placed on a weightless simple balance. The system is equilibrium.



Compare the density of liquid X and that of Y (2 marks)

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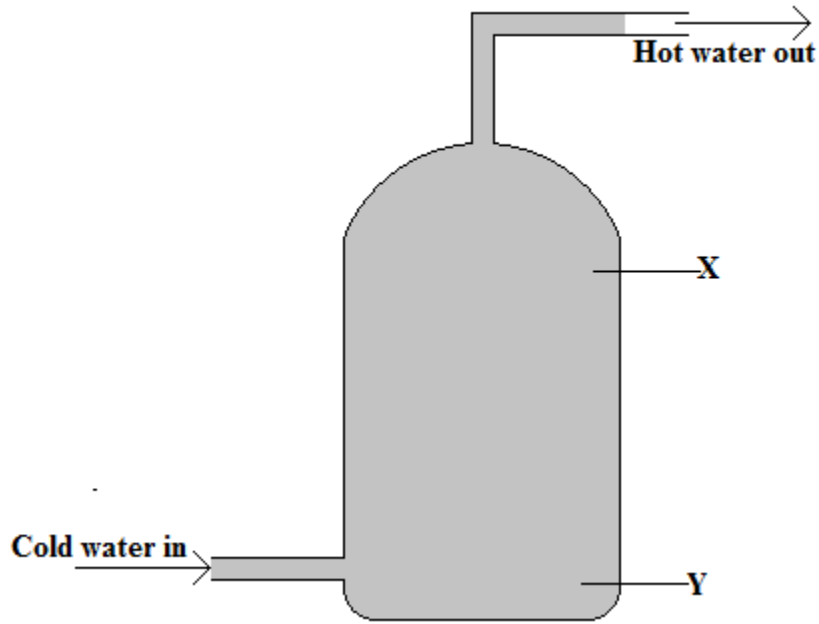
8. The figures below show an arrangement of two pulleys used to lift same load of 100N



State with a reason the system that is more efficient (2 marks)

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9. The figure shows a water tank that is used to heat water and supply through taps.



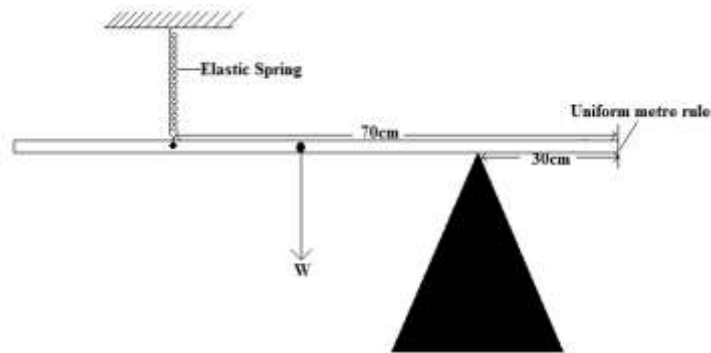
State with a reason whether the appropriate position for a heater is X or Y (2 marks)

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10. The figure shows a uniform metre of mass 200g balance by a spring balance placed 70cm from one. The pivot is placed 30cm away from the same end. Study the diagram and answer the questions that follow



Determine tension T on the spring (2 marks)

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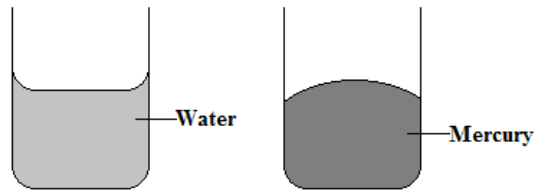
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11. State the cause of random motion of smoke particles as observed in Brownian motion experiment using a smoke cell. (1 mark)

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12. The figure shows the level of mercury and water in identical glass beakers



Explain the difference in the shapes of the meniscus (2 marks)

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13. A wooden block of mass 2kgs is placed on a horizontal surface. A horizontal force of 12N is exerted on it makes it to accelerate at 5ms^{-2} . Determine the frictional force acting between the surfaces. (2 marks)

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SECTION B (55 MARKS)
ANSWER ALL QUESTIONS IN THIS SECTION IN THE SPACES PROVIDED

14.
a) State the two conditions necessary for a system of forces acting on a body to be in equilibrium (2 marks)

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b) The figure shows a loaded wheelbarrow held in equilibrium by a gardener. The wheel of the wheelbarrow is in contact with the ground at point C



There are three vertical forces acting on the wheelbarrow P is the upward force applied by the gardener. Q is the upward force of the ground on the wheel at point C . W is the weight of the wheelbarrow and its contents. Explain why the force P is less than the force W

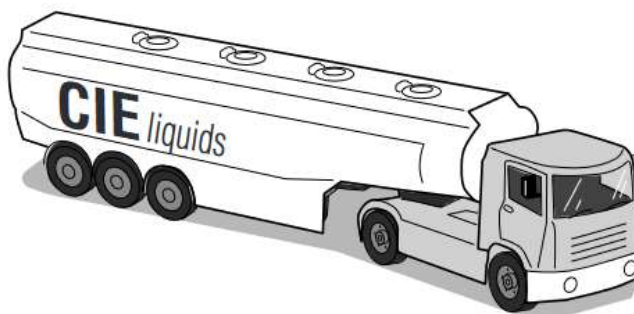
- i. By considering the forces P , Q and W , (2 marks)

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- ii. By considering the moments of the forces P and W about point C . (2 marks)

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- c) The figure shows a tanker lorry full of liquid. Study the diagram and answer the questions that follow



- i. The tanker delivers the liquid and drives away empty. Compare the acceleration of the empty tanker with the acceleration of the full tanker for the same resultant force (2 marks)

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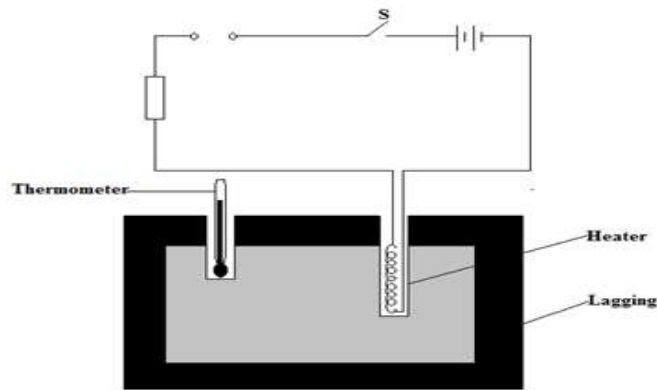
- ii. Given that empty tanker has a weight of 50 000 N. The forward force is 6000 N and the total resistive force is 2000N. Determine the acceleration of the tanker (3 marks)

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15.
a) A warm bottle of soda placed in ice at 0°C cools faster than when the same soda is placed in water at the same temperature. Explain this observation (2 marks)

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- b) The figure shows an incomplete circuit set up that can be used in an experiment to determine the specific heat capacity of a solid block by electric method. Study the diagram and answer the questions that follow



- i. State the purpose of the rheostat in the experiment (1 mark)

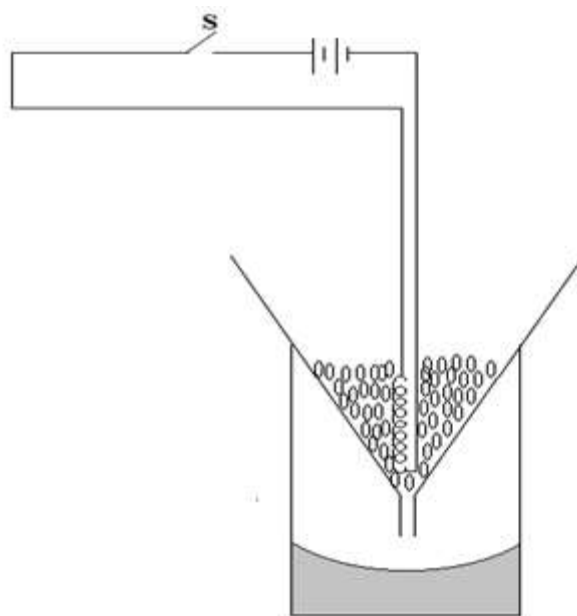
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ii. Complete the diagram by inserting the missing components for the experiment to work (2 marks)

iii. Other than temperature, state three measurements that should be taken (3 marks)

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c) The figure shows a set-up of apparatus used in an experiment to determine the specific latent heat of fusion of ice. Study the diagram and answer the questions that follow



The following readings were noted after the heater was switched on for 10 minutes

- **Mass of the beaker=260g**
- **Mass of the beaker +melted ice =280g**

Determine

- i. The energy supplied by the 120W heater in the 10 minutes (3 marks)

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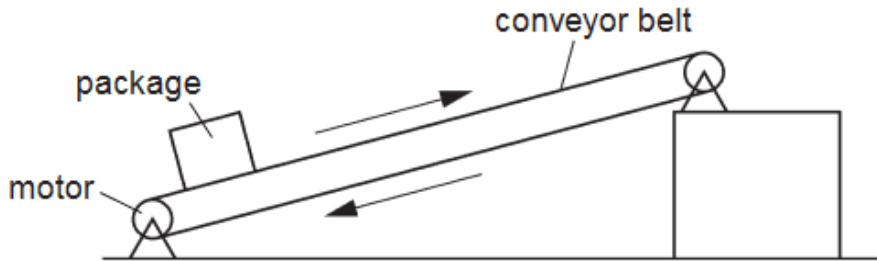
- ii. The specific latent heat of fusion of the ice (3 marks)

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- iii. The experiment value for the specific latent heat of fusion of ice obtained is less than the theoretical value. Give one reason for this observation (1 mark)

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16. The figure shows a conveyor belt transporting a package to a raised platform. The belt is driven by a motor.



The mass of the package is 36 kg.

Determine

- a) The increase in the gravitational potential energy (G.P.E.) of the package when it is raised through a vertical height of 2.4 m. (2 marks)

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- b) The power needed to raise the package through the vertical height of 2.4 m in 4 s (2 marks)

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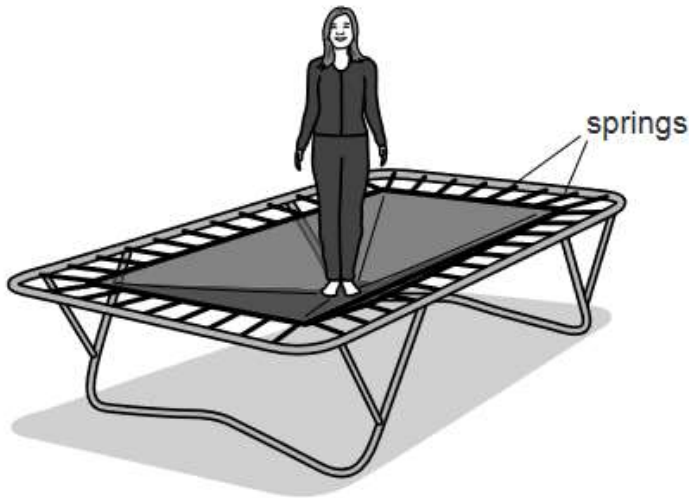
c) The electrical power supplied to the motor is much greater than the answer to (b).
Explain how the principle of conservation of energy applies to this system. (2 marks)

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d) Assume that the power available to raise packages is constant. A package of mass greater than 36 kg is raised through the same height. Suggest and explain the effect of this increase in mass on the operation of the conveyer belt. (2 marks)

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17. An athlete of mass 64 kg is bouncing up and down on a trampoline.
At one moment, the athlete is stationary on the stretched surface of the trampoline as shown in the figure below.



a) State the form of energy stored due to the stretching of the surface of the trampoline. (1 mark)

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b) The stretched surface of the trampoline begins to contract. The athlete is pushed vertically upwards and she accelerates. At time t , when her upwards velocity is 6.0 m / s , she loses contact with the surface. Determine

i. Her kinetic energy at time t . (2 marks)

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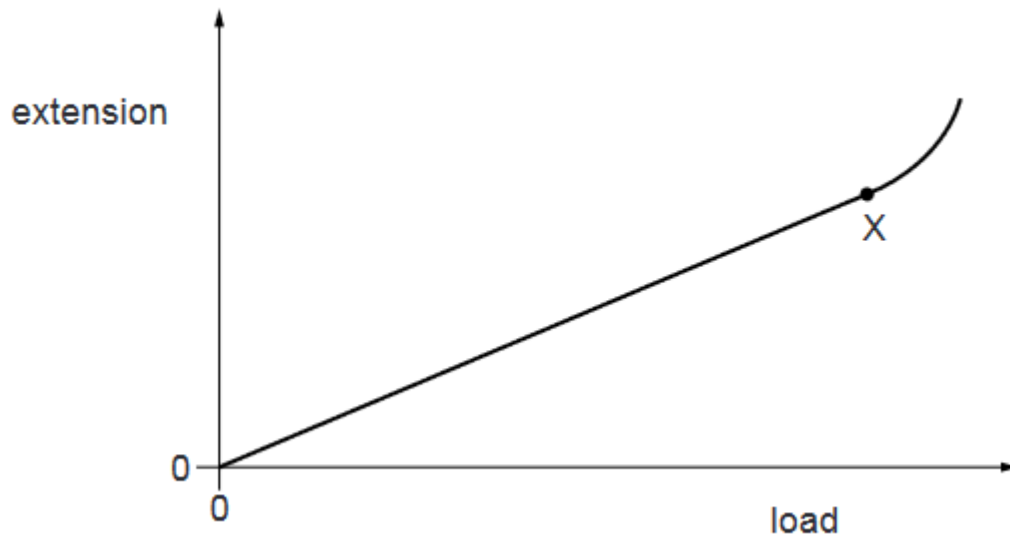
ii. The height at which the kinetic energy will be zero (2 marks)

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c) In practice, she travels upwards through a slightly smaller distance than the distance calculated in (ii). Suggest why this is so. (1 mark)

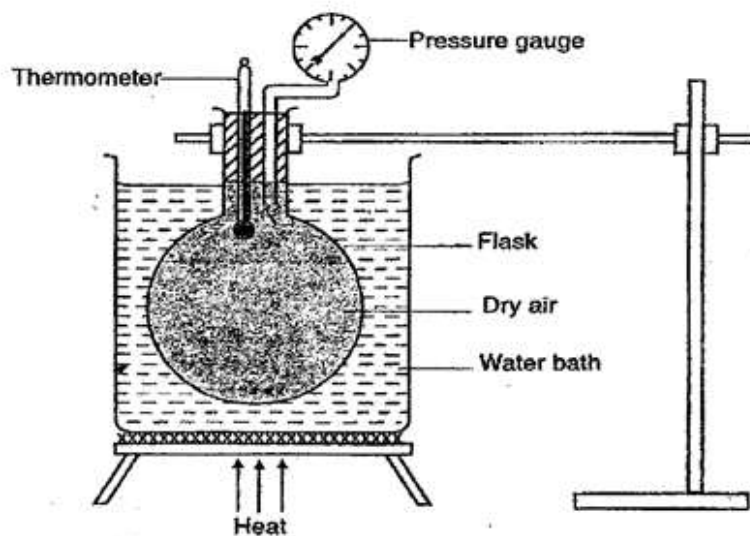
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d) The trampoline springs are tested. An extension-load graph is plotted for one spring. Fig. 3.2 is the graph.



- i. On the same axes sketch a graph of another spring whose spring constant is higher than the trampoline springs (1 mark)

18.
a) The diagram below shows a set-up used to investigate a particular gas law. Study the diagram and answer the questions that follow



i. State with a reason which gas law is being experimented by the set-up (2 marks)

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ii. Name the two factors that are held constant in the experimented (2 marks)

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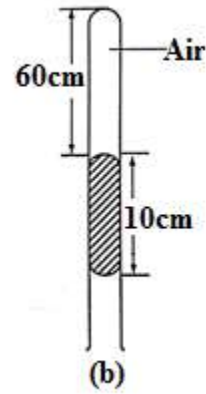
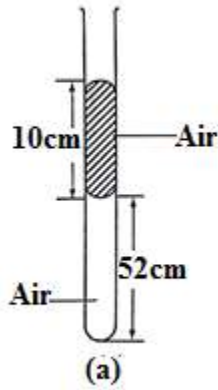
iii. Give the reason why heating is done through a water bath (1 mark)

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b) Figure (a) shows 52cm of air trapped by a mercury column of 10cm while figure (b) shows the column of air when the glass tube is inverted



Determine the atmospheric pressure in mmHg

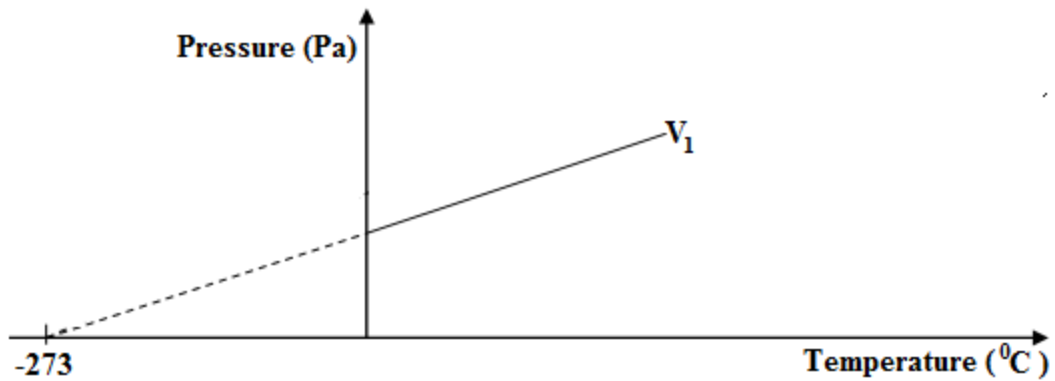
(3 marks)

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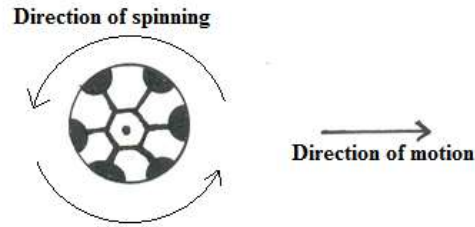
c) The graph below shows the relationship between the pressure and temperature of a gas of volume V_1



On the same axis sketch another graph for a gas of a larger volume.

(1 mark)

- d)
i. The figure below shows a ball spinning in anticlockwise direction through still air



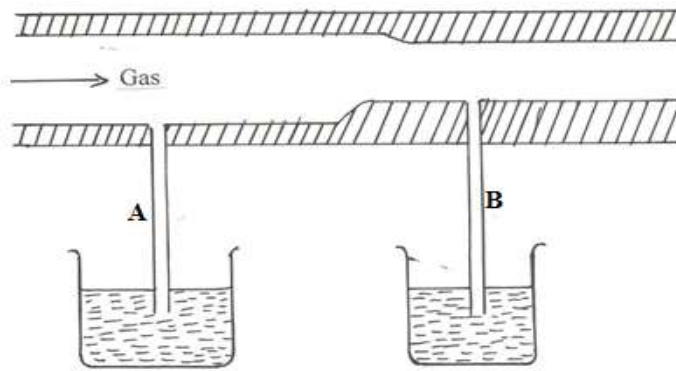
The horizontal distance covered by the ball is observed to be longer than when the ball is not spinned. Explain how the spinning increases the range of the ball (3marks)

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- ii. The figure below shows gas flowing along a pipe of non-uniform cross-sectional area. Two pipes A and B are dipped into liquids as shown below.



Indicate the levels of the liquids in A and B giving a reason for your answer (2marks)