Name ..... Index No. .....

School .....Candidate's signature .....

232/1 Date .....

PHYSICS
Paper 1
July/August 2016
Time 2 hours

KERICHO WEST FORM FOUR JOINT EVALUATION

Kenya Certificate of Secondary Education

PHYSICS

Paper - 232/1

July/August 2016

Time: 2 hours

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided above.
- Sign and write the date of the examination in the spaces provided above.
- This paper consist of two sections A and B.
- Answer ALL questions in section A and B in the spaces provided.
- All working must be clearly shown in the spaces provided in this booklet.
- Non-programmable, silent electronic calculators and KNEC mathematical tables may be used.

EXAMINER'S USE ONLY

SECTION	Questions	Maximum score	Candidate score
A	1 to 13	25	
B	14	12	
	15	13	
	16	13	
	17	12	
	18	5	
TOTAL SCORE		80	

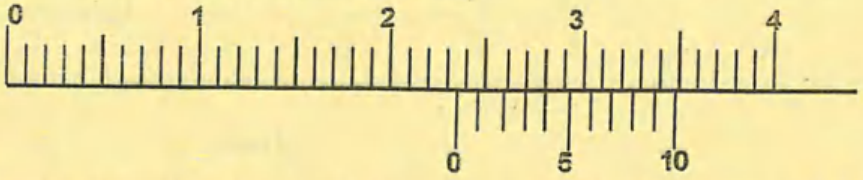
This paper consists of 12 printed pages
Candidates should check the question paper to ensure that all the printed pages are printed as indicated and no questions are missing.

SECTION A (25 marks)

Answer ALL the questions in the spaces provided.

1. The figure 1 below shows a vernier calliper scale.

Fig 1



Determine the actual reading of the scale if the instrument has zero error of 0.02cm (2 marks)

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2. Explain why it is difficult to close a door by pushing it next to hinges. (1 mark)

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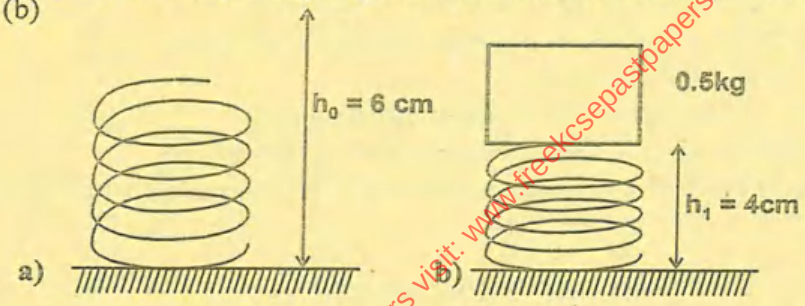
3. The figure 2 below shows a spiral spring fixed on a bench vertically a mass of 0.5kg is placed on top as shown in (b)

Fig 2



In (a), the height h_o = 6cm while in (b), the height h_1 = 4cm. Find the energy stored in the spring in (b)

(3 marks)

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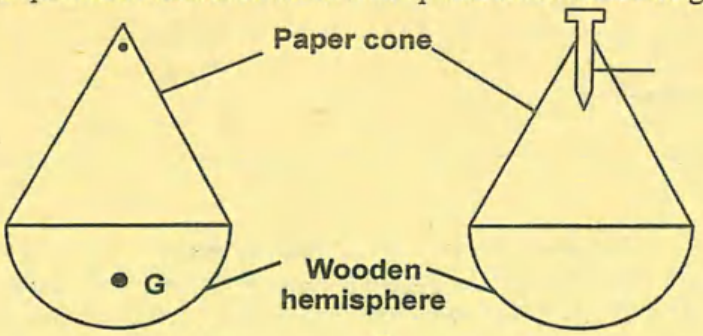
4. The figure 3 below shows a toy made from a hemispherical wooden base and a paper cone. Use the figure to answer the questions that follow. G is the position of centre of gravity.

Fig 3



a) In what state of equilibrium is the toy in 2(a)? (1 mark)

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b) Explain why if a nail is pushed through the head of the toy as in 2(b) the toy can easily be tilted to lie on the side. (1 mark)

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5. In the Brownian motion experiment smoke particles are observed to move randomly. Explain how this motion is caused. (2 marks)

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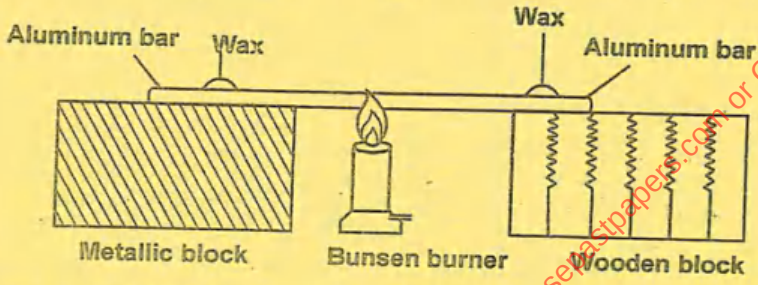
6. Two identical aluminium rods are placed as shown in figure 4 below. One rests on a metal block and the other on a wooden block. The protruding ends are heated on a Bunsen as shown.

Fig 4



State with reason on which bar the wax likely to melt sooner. (2 marks)

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7. Water drops from a height of 90m. The temperature at the bottom is found to be 28°C. Calculate its temperature at the top. (Specific heat capacity of water is $4200JKg^{-1}k^{-1}$) (2 marks)

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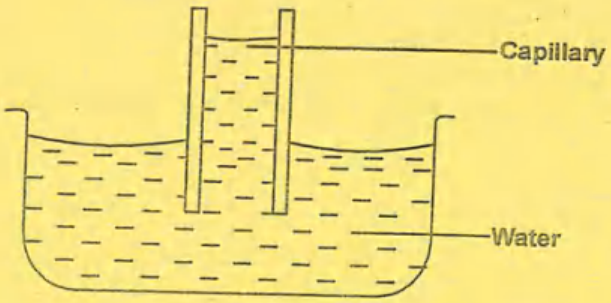
8. A capillary tube is dipped in water as shown in figure 5 below.

Fig 5



List two differences that will be observed when water is replaced with mercury in the set-up above. (2 marks)

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9. State the SI unit of luminous intensity. (1 mark)

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10. At a place where atmospheric pressure is 730mm Hg a faulty barometer reads 680mm Hg.

i) Calculate in SI units the pressure of air above mercury in the barometer. (1 mark)

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ii) How would you test whether or not the barometer has air above the mercury? (1 mark)

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11. A block of mass 272kg is pulled along a levelled ground, the co-efficient of sliding friction is 0.4. If the block has an acceleration of $0.4m/s^2$, what is the force pulling it? (2 marks)

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12. The figure 6 below shows a metre rule balancing when a mass of 200g is hanged at one end as shown.

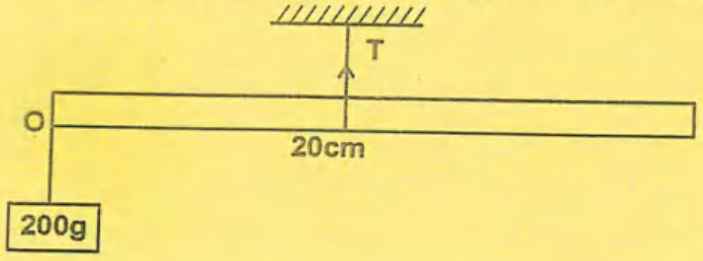

Fig 6

Determine the tension T and the weight W. (2 marks)

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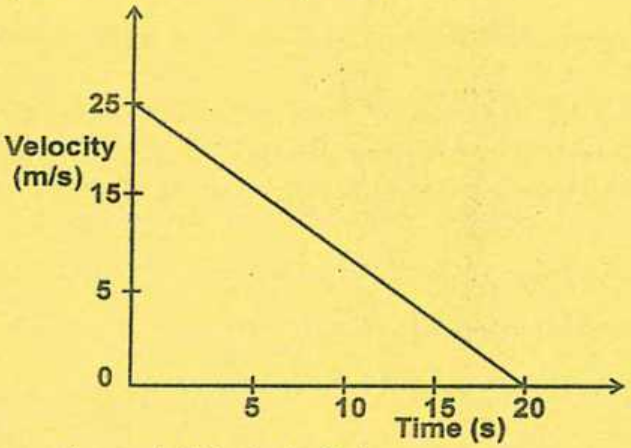
13. The figure 7 below represents a velocity - Time graph of a ball bouncing upwards from the ground. The velocity upwards is taken to be positive.

Fig 7



Determine the maximum height the ball rises. (2 marks)

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SECTION B (55 marks)

14.a) Define absolute zero temperature of an ideal gas. (1 mark)

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b) Using kinetic theory, explain how a rise in temperature of a gas causes a rise in pressure of the gas at constant volume. (2 marks)

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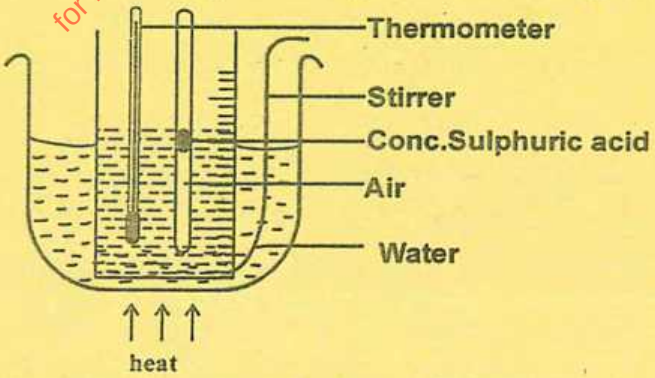
c) The figure 8 below shows a set-up to investigate the relationship between temperature and volume for a certain gas.

Fig 8



i) State two factors that are kept constant inorder to determine the relationship. (2 marks)

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ii) Explain the function of :

I. concentrated sulphuric acid. (1 mark)

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II. Stirrer. (1 mark)

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iii) Explain how the set-up above can be used to verify the law. (3 marks)

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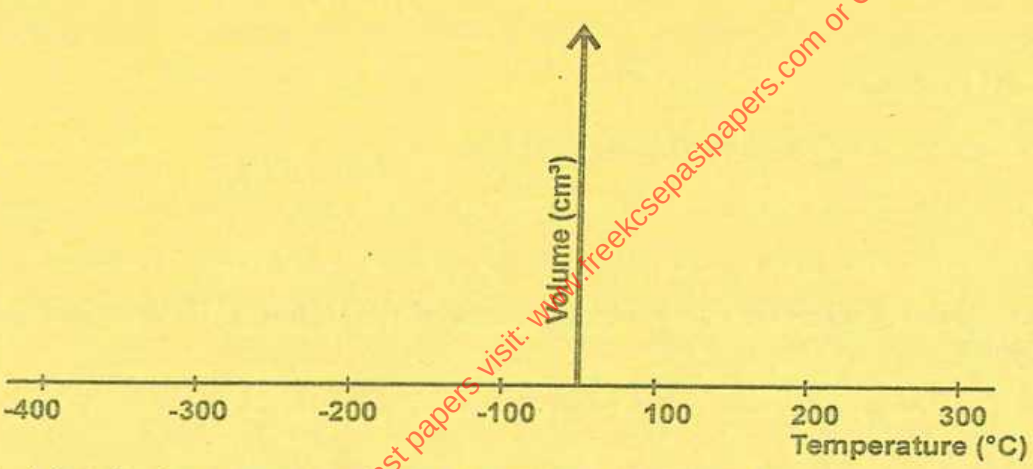
d) i) On the grid below, sketch a graph of volume (cm^3) against temperature for the experiment above. Clearly mark with letter T the absolute zero temperature. (2 marks)



ii) Explain why the temperature in part d(i) cannot be achieved. (1 mark)

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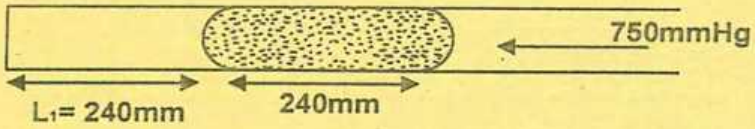
e) Air trapped inside a glass tube by a thread of mercury 240mm long. When the tube is held horizontally, the length of the air column is 240mm.

Fig 9



Assuming that atmospheric pressure is 750mm Hg and the temperature is constant, calculate the length of the air column when the tube is vertical with the open end upwards. (3 marks)

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15.a) Distinguish between angular displacement and angular velocity. (2 marks)

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b) The figure 10 below shows a mass moving on a horizontal plane.

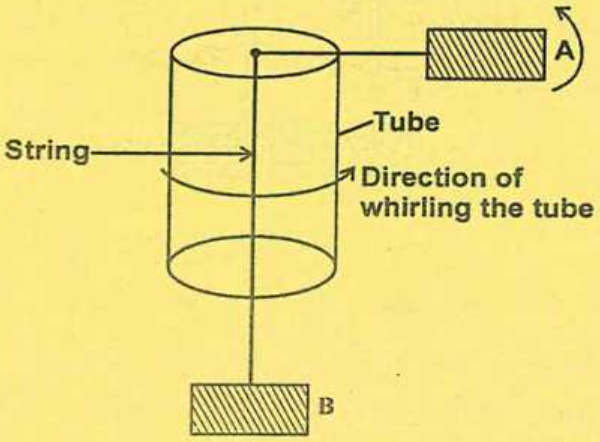

Fig 10

i) State what is observed on mass B. (1 mark)

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ii) Explain your answer in(i) above. (1 mark)

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c) i) The figure 11 below shows a boy of mass 50kg swinging on a rope of length 2m.

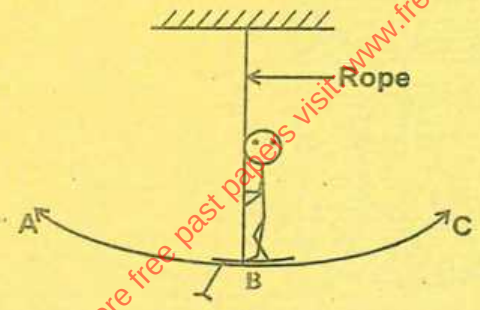

Fig 11

If the tension on the tope is 549N, calculate the velocity of the boy at the position shown in the diagram. (3 marks)

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ii) State the form of energy possessed by the boy at positions A and B. (2 marks)

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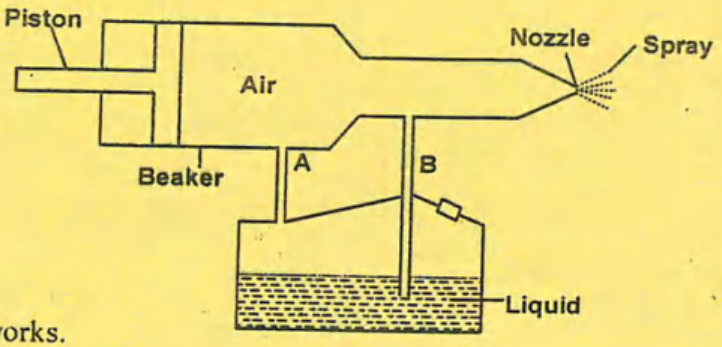
iii) The diagram below shows a spray gun.

Fig 12



Explain how it works. (4 marks)

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16.a) State the law of floatation. (1 mark)

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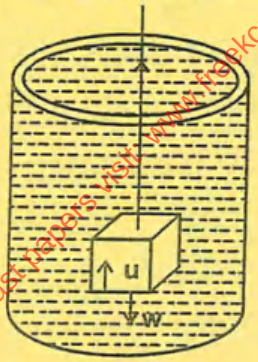
b) The figure 13 below shows a rectangular block of density 10,500kg/m³ and dimensions 30cm by 20cm by 20cm suspended inside a liquid of density 1200kg/m³ by a string attached to a point above the liquid. The three forces acting on the block are; tension T, on the string, weight W, of the block and upthrust U. due to the liquid.

Fig 13



i) Write an expression relating T, W and U when the block is in equilibrium. (1 mark)

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ii) Determine the weight W, of the block. (3 marks)

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iii) Determine the weight of the liquid displaced by the block when fully submerged. (2 marks)

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iv) Hence, determine the tension T, in the string. (1 mark)

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c) A certain solid of volume 50cm³ displaces 10cm³ of kerosene of density 800kg/m³ when floating. Determine the density of the solid. (4 marks)

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17. a) Define stating SI units the specific latent heat of fusion. (1 mark)

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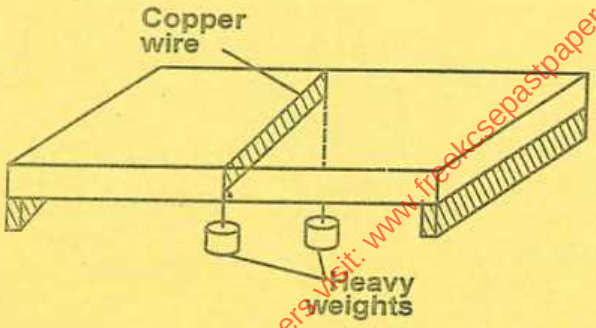
b) The figure 14 below shows a block of ice. A thin copper wire with two heavy weights hanging from its ends passes over the block.



i) State and explain the observation made after some time. (3 marks)

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ii) What would be the effect of replacing the copper wire with iron wire? (2 marks)

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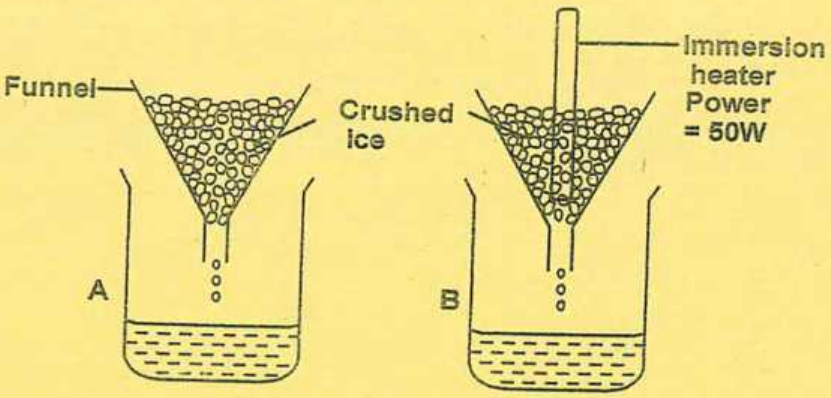
c) Figure 15(a) and (b) below shows methods of measuring specific latent heat of fusion of ice. Two funnels A and B contain crushed ice at 0°C.

Fig 15



The mass of melted ice on each funnel is measured after 12 minutes.
Mass of melted ice A = 200g
Mass of melted ice B = 308g

i) What is the reason for setting up funnel A? (1 mark)

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ii) Determine the:

I. Quantity of heat supplied by the heater. (2 marks)

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II. Mass of ice melted by the heater. (1 mark)

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III. Specific latent heat of fussion of ice. (3 marks)

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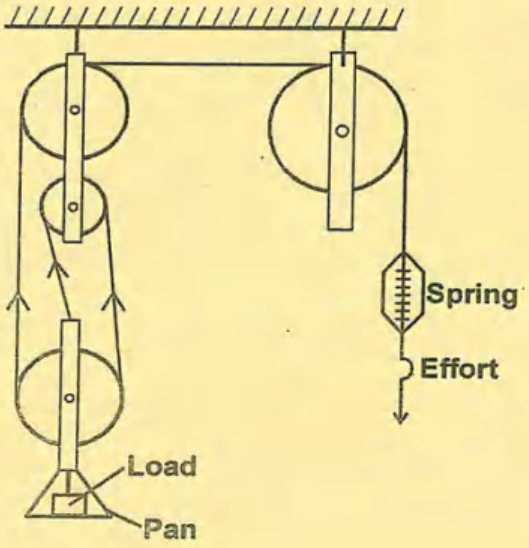
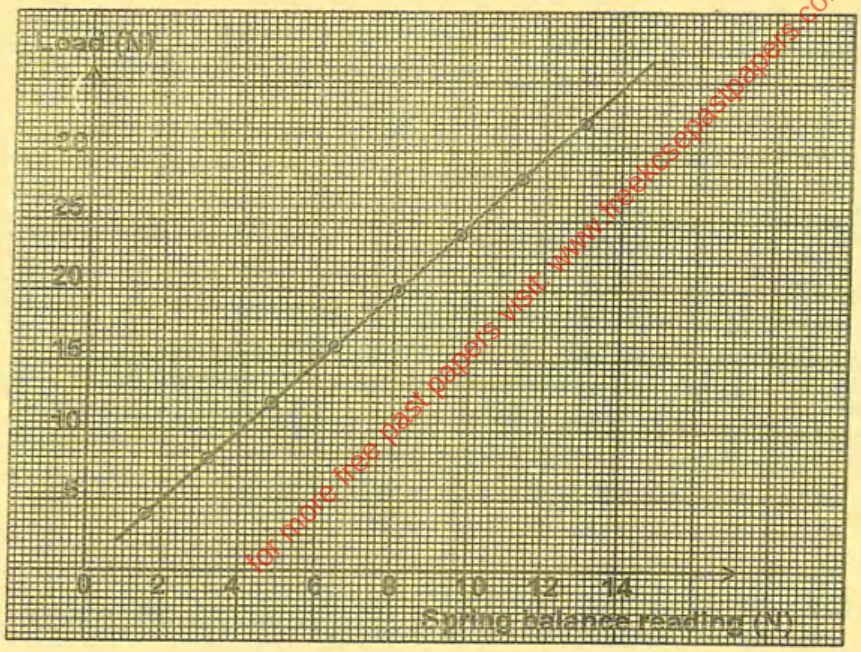
18. A form 3 student arranged a block and tackle pulley system as shown below. Different masses were placed on to the pan and a spring balance was used to record different pulling forces that would make the masses move up a distance of 1.5m.

Fig 16



A graph of load against spring balance reading was plotted as shown below.



a) From the graph, determine the mechanical advantage of the system. (3 marks)

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b) Determine the distance moved by the effort downwards. (2 marks)

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