232/1
PHYSICS
Paper 1
Time: 2 hours

ALLIANCE GIRLS HIGH SCHOOL
MOCK EXAM

INSTRUCTIONS TO CANDIDATES.

1. Answer ALL the questions in the spaces provided after each question paper.
2. Additional papers must not be inserted. All working must be clearly shown where necessary.
3. Candidates will be penalized for recording irrelevant information and incorrect spelling especially of technical terms.
4. All working must be clearly shown where necessary.

FOR EXAMINER'S USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
A	1 - 14	25	
B	15	10	
	16	13	
	17	12	
	18	10	
	19	10	
TOTAL		80	

This paper consist of 8 printed pages

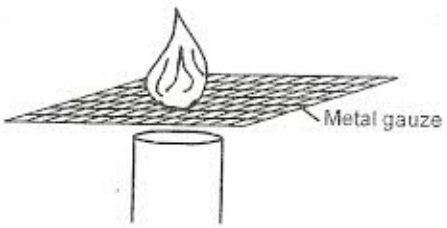
Candidates should check the questions paper to ensure that all the pages are printed as indicated and no questions are missing.

SECTION A (25 marks)

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

1. The pitch of a micrometer screw gauge is 1mm and the head scale has 100 divisions. When a wire is placed between the anvil and the spindle, it reads 1mm and 80 divisions. If the micrometer screw gauge has a zero error of -4 divisions, find the thickness of the wire. (1mk)

2. In the figure below the gas was opened and lit above the gauze. Explain why the gas below the gauze does not light for sometime. (1mk)

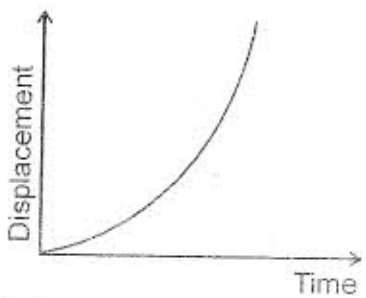


3. Calculate the tension developed in a string supporting a mass of 180g. (2mks)

4. The figure below shows a thin wooden strip of negligible weight balanced by forces F_1 and F_2. Show the relationship between d_1 and d_2 (2mks)

5. An old man believes that if somebody stands besides a fast moving train, he is pulled towards the train. As a Physics student explain to him what happens. (2mks)

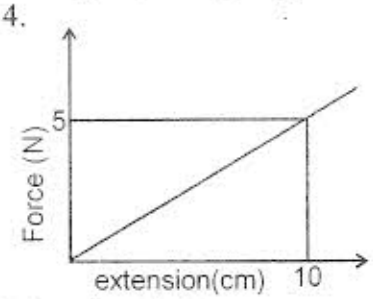
6. The Figure below shows a displacement – time graph of a body.



Describe the motion. (1mk)

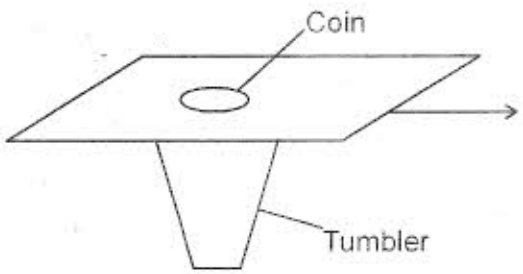
7. Lycopodium powder is lightly sprinkled on a clean water surface in a large tray. A red hot needle is plunged into the centre of the water surface. State and explain the observation. (2mks)

8. In an experiment to verify Hooke's law using a spiral spring, the results obtained were used to plot the graph shown in figure 4.



How much work is done in stretching this spring by 8cm. (3mks)

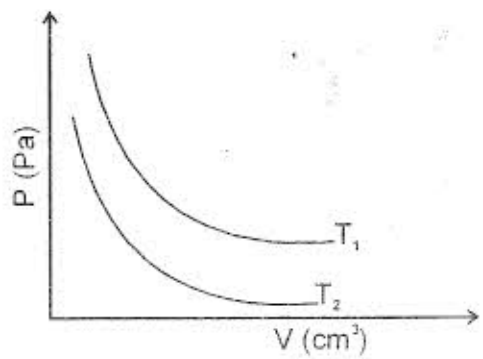
9. The figure below shows a smooth card placed on the open end of a tumbler. A coin is placed on the card. When the card is pulled away suddenly, the coin drops into the tumbler.



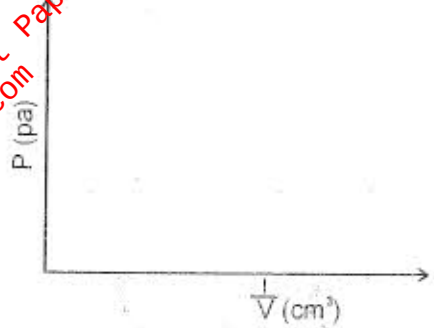
Explain the observation. (1mks)

10. State two physical quantities that remains constant when pure water vapourises. (2mks)

11. Figure below shows a graph of pressure against volume for a certain gas when the temperature is constant at T_1 and T_2.

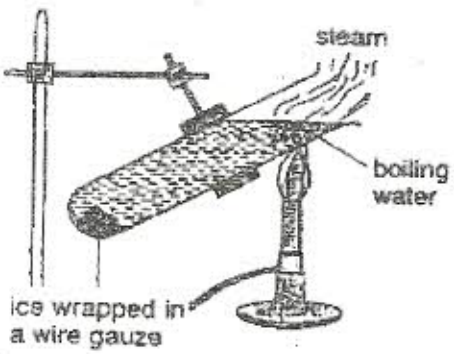


On the axes below sketch a graph of pressure against for $\frac{1}{v}$ T_1 and T_2. (2mks)



12. Explain why a person can swim in sea water more easily than in fresh water. (2mks)

13. Figure shows water boiling at the top of a boiling tube while at the bottom ice remains cold. Give a reason for this. (1mk)

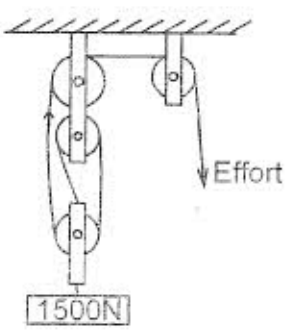


14. A student placed a block of wood of weight 50N onto a trolley of mass 4.5kg when the trolley was moving at a velocity of 2ms^{-1}. Determine the velocity of the trolley thereafter. (3mks)

SECTION B (55MKS)

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

15. The figure below shows a pulley system used to lift a load of 1500N. An effort of 800N is used to move the load a distance of 12m.



Find;

(i) The velocity ratio of the machine. (1mk)

(ii) The mechanical advantage of the machine. (2mks)

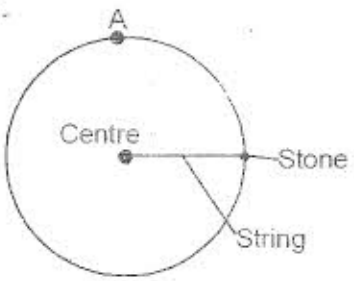
(iii) The distance moved by the effort. (3mks)

(iv) The efficiency of the machine. (2mks)

(v) State two reasons why the efficiency of the machine is not 100% . (2mks)

16. a) A body moving in a circular path at constant speed is said to be accelerating. Explain. (1mk)

b) The figure below shows a stone of mass 80g whirled in vertical circle of radius 40cm.



(i) Show on the diagram the direction of linear velocity of the stone. (1mk)

(ii) Calculate the minimum speed of the stone as it passes through point A. (2mks)

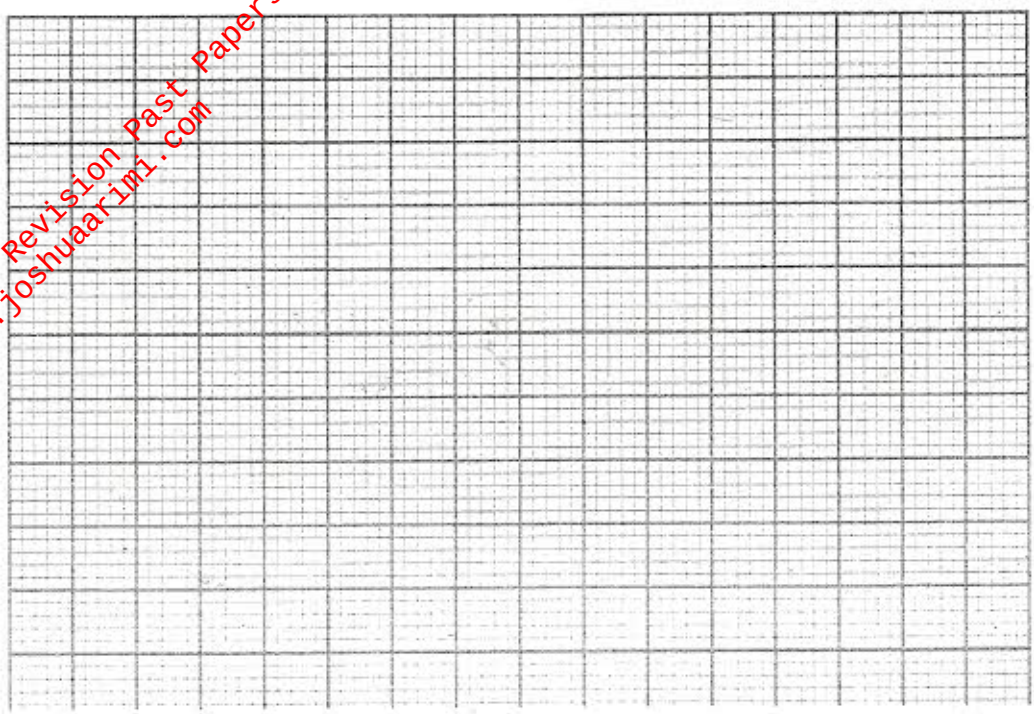
c) Antonina was whirling water in a bucket in a vertical circle. She realized that when the speed of rotation was decreased, some water poured out of the bucket when the bucket was vertically above. Explain. (1mk)

d) The table below gives the centripetal force, F, acting on a body moving in a circle of radius 1m for different speeds V of the body.

(i) Complete the table below. (1 mark)

Force F, (N)	0.4	1.6	3.6	6.4	10.0	14.4
Speed V (ms^y)	1.0	2.0	3.0	4.0	5.0	6.0
$V^2(m^2s^{-2})$						

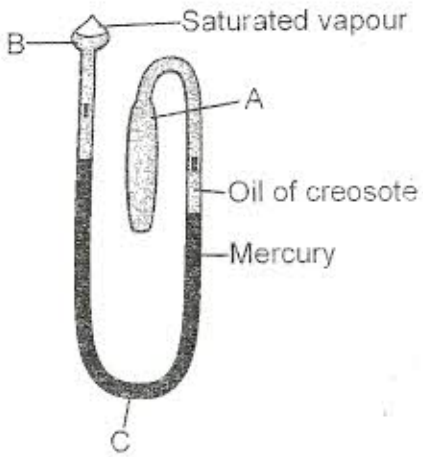
(ii) Plot a graph of Force, F against V^2 on the grid provided. (5mks)



(iii) Use the graph to determine the mass of the body. (2mks)

17. a) Define the term temperature. (1mk)

b) The figure below shows a six's maximum/minimum thermometer.



(i) What is the thermometric liquid in this thermometer. (1mk)

(ii) The vapour in bulb B is saturated. Why is this necessary. (1mk)

(iii) Explain how the thermometer indicates maximum and minimum temperature. (4mks)

(iv) Indicate on the figure the two points where the minimum and maximum readings of the temperature shown by the thermometer can be made. (2mks)

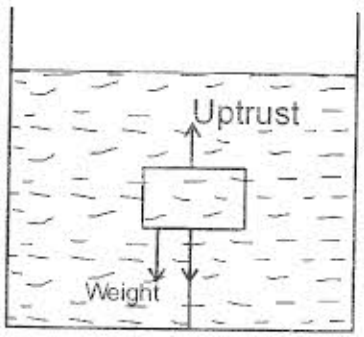
(v) What is the use of a small magnet (not shown) usually hung on the frame of this thermometer. (1mk)

18. a) State the law of flotation. (1mk)

b) A block of lead of density 11.4g/cm^3, measures 5cm by 2cm by 3cm. It floats in mercury with its longest side vertical.

(i) Find the volume of the block under the mercury surface. (3mks)

(ii) A downward force F is applied on the block until it is completely submerged. Calculate the force F. (3mks)



c) A piece of wood of mass 12g is kept under water by means of a string as shown the figure above. Its volume is 30cm^3.

(i) Indicate on the diagram two other forces acting on the piece of wood. (2mks)

19. a) In an experiment to demonstrate Brownian motion, smoke was placed in an air cell and observed under a microscope. Bright specks were observed to move randomly in the cell.

(i) What were the bright specks. (1mks)

(ii) Account for the random motion observed. (1mk)

(iii) Why are small particles such as those of smoke used in this experiment. (1mk)

(iv) What would be observed if the temperature of the smoke cell was raised? (1mk)

b) An oil drop of average diameter 0.9mm spreads out into a circular patch of diameter 40cm on the surface of water in a trough.

(i) Calculate the average thickness of a molecule of the oil. (3mks)

(ii) State two assumptions made in b (i) when calculating the thickness of the oil molecule. (2mks)

c) Using molecular nature of matter, explain why a solid expands when heated. (1 mk)