NAME.. ADM NO.............................

SCHOOL... CANDIDATES SIGN..............

DATE ....

232
PHYSICS
FORM 2
TIME: 2 HOURS

END OF TERM (III) EXAMINATION -2019
Kenya Certificate of Secondary Education (K.C.S.E)

232
PHYSICS
FORM 2
TIME: 2 HOURS

INSTRUCTIONS TO THE CANDIDATES

- Write your name, admission number, class and date of examination
- The paper consists of Section A and B
- Answer all the questions in Section A and B in the spaces provided
- All working must clearly be shown on the spaces provided
- Mathematical tables and electronic calculators may be used

For examiners use only

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE SCORE
A	1-19	40	
B	20	8	
	21	7	
	22	6	
	23	6	
	24	7	
	25	7	
	26	7	
	27	7	
	28	6	
TOTAL		100	

1. A pen was accidentally dropped into a measuring cylinder containing water. The volume of water moved from an initial level to the level shown in figure 1 below.
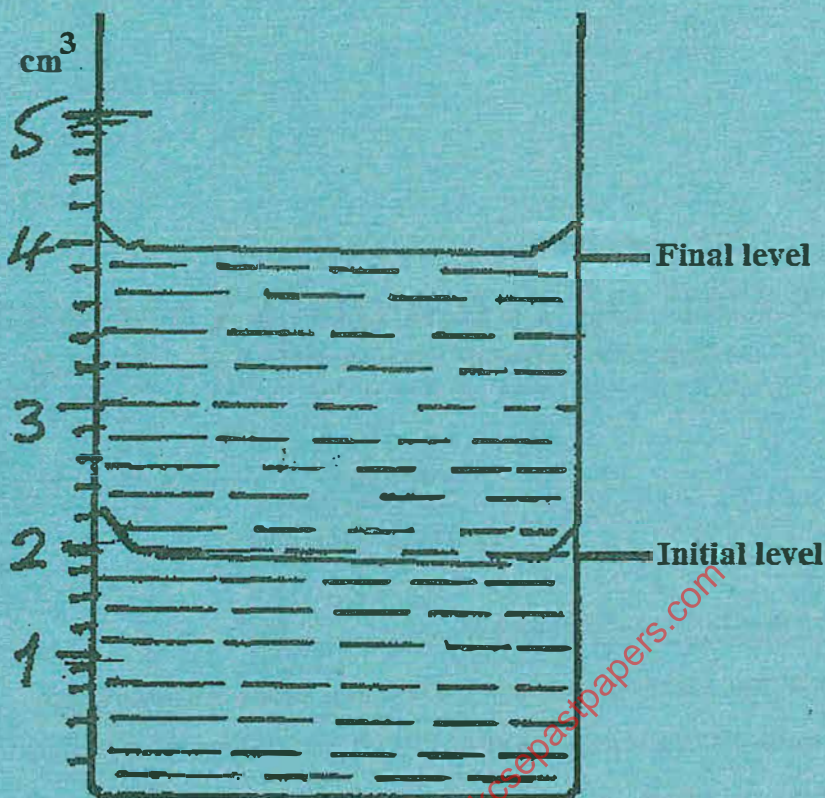
If the mass of the pen is 0.012kg determine its density   (3mks)

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2. (a) Figure 2 below shows a needle floating on water.

Fig 2

State why the needle will sink when the water is heated   (1mk)

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(b) State with a reason which of the two drops shown in the figure 3 below is a water drop.

(2mks)

Fig 3

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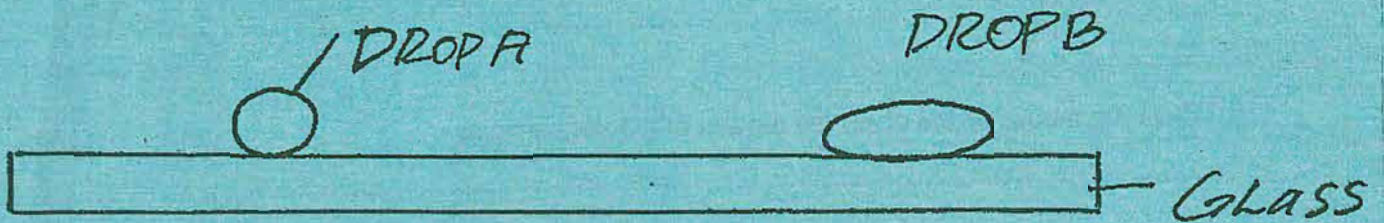
3. The diagram in the figure 4 below shows a beam of negligible weight balanced by constant forces P & Q
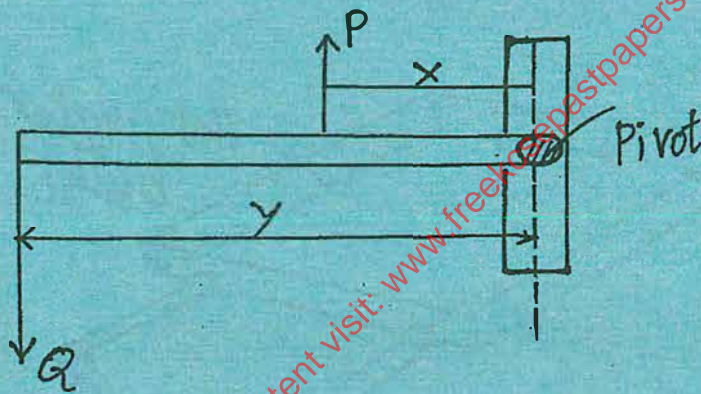
Fig 4

Derive the relation between X and Y (2mks)

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4. Figure 5 below is a smoke cell used to observe the motion of particles in the study of Brownian motion.
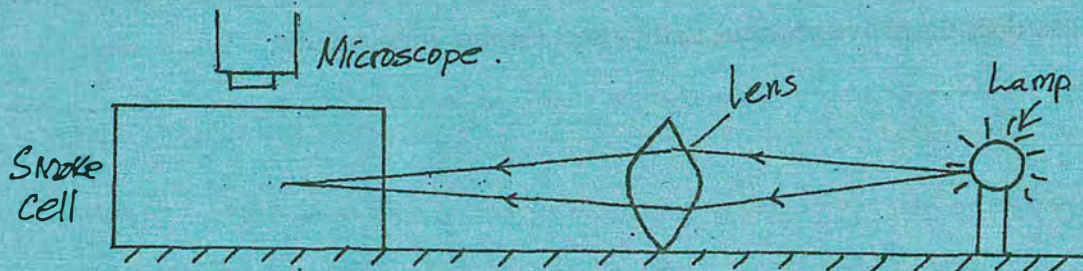
Fig 5

(a) What is the role of the microscope (1mk)

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(b) State the nature of the observed motion of smoke particles (1mk)

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(c) What is the effect on the motion if the temperature of the smoke cell is lowered (1mk)

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5.   In figure 6 below, two metallic rods of the same material and length are held against a hot water bath. At their respective ends, wax is stuck with two identical hanging thumb pins as shown.
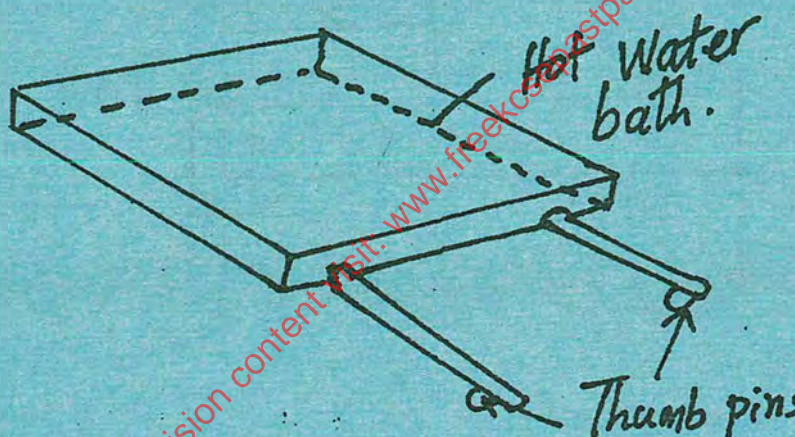
Figure 6

(i) State one physical difference between the rods that will cause the thumb pins to fall at different times (1mk)

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(ii) How does the above physical factor affect thermal conductivity (1mk)

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6. Figure 7 below shows an object O placed in front of a plane mirror

fig 7

On the same diagram, draw rays to locate the position of the image I, as seen from the eye E.

(3mks)

7. Figure 8 below shows two bar magnets and a soft iron ring placed between the two magnets.
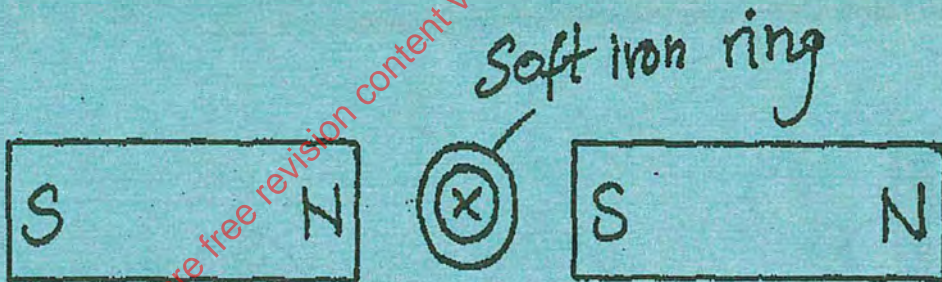
A compass needle was placed in the region marked X inside the iron ring. State what was observed. Give reasons for your answer (2mks)

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8.   Figure 9 below shows a marble placed on an inverted bowl.
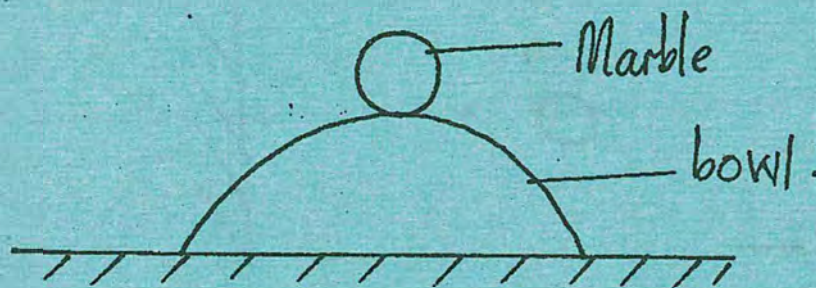
Fig 9

State the type of equilibrium that the marble has   (1mk)

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9.   State with reason the type of reflector preferred for solar concentrators   (2mks)

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10.   State Hooke's law.   (1mk)

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11.   Figure 10 below shows a wave profile whose frequency is 2.5Hz
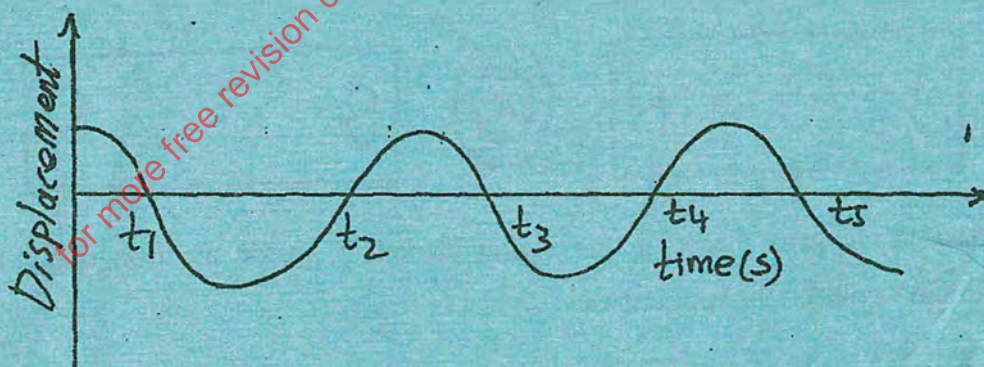
Fig 10

Determine the value of t_3 (2mks)

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12. A vernier calipers with a negative zero error of 0.03cm was used to measure the diameter of a metal rod. If the reading obtained was 3.79cm, state the actual diameter of the rod. (2mks)

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13. Ducks are able to walk over swampy grounds without sinking. Explain (1mk)

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14. (a) A clinical thermometer should not be sterilized in boiling water. Explain why (1mk)

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(b) State how it is sterilized (1mk)

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15. A highly positively charged sphere is suspended by an insulating thread. A negatively charged conductor is suspended near it. The conductor is first attracted, and after touching the sphere it is repelled. Explain this observation (2mks)

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16. State **two** factors that can lead to increase in speed of sound in air (2mks)

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17. (a) Three identical bulbs are connected in series with a battery and their brightness observed

Explain how you can increase the brightness of the bulbs using the same battery. (2mks)

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(b) State **one** advantage of a lead acid accumulator over nickel-iron accumulator   (1mk)

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18.   An electromagnet is made by winding insulated copper wire on a straight soft iron core. State two

changes that could be made to decrease the strength of the electromagnet.   (2mks)

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19.   Figure 11 below shows a sheet of paper rolled into a tube. State and explain the observation made

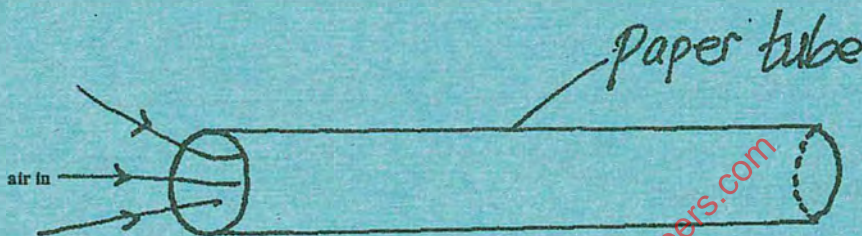when a stream of air is blown into and through the paper tubes.   (2mks)

Fig 11

SECTION B

20.   (a) State the principle of transmission of pressure in liquids   (1mk)

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(b) A hydraulic press consists of two cylinders of cross-sectional area $0.2m^2$ and $5m^2$. If the piston

in the smaller cylinder is pushed down with a force of 100N,

calculate.

(i) The pressure transmitted by the fluid.   (3mks)

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(ii) The force exerted on the larger piston   (2mks)

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(c) State any **two** characteristics of the fluid used in the above hydraulic press.   (2mks)

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21.   (a) Figure 11 below shows a set up of a simple cell.
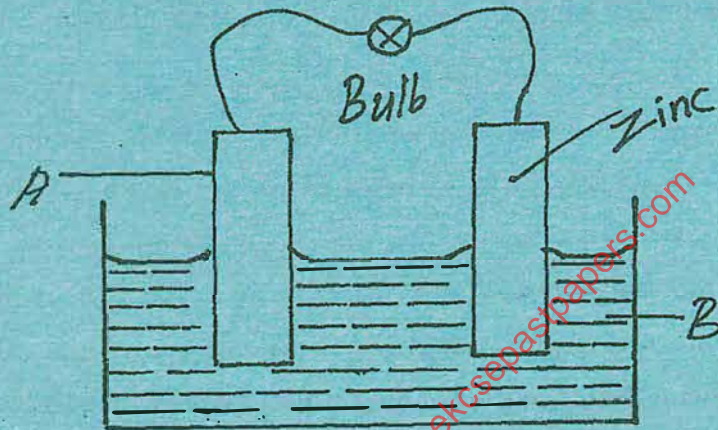
Fig 12

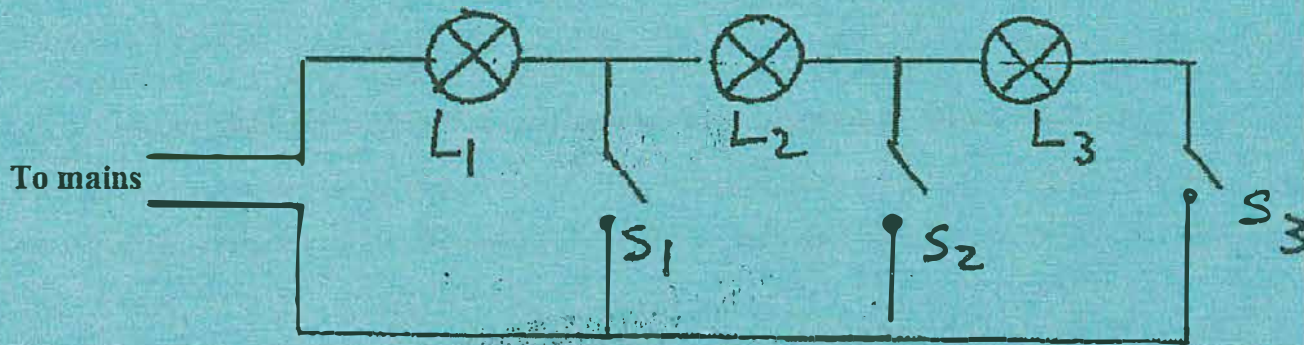(i)   Name the electrode A and electrolyte B   (2mks)

A ....

B ....

(ii)   State **two** reasons why the bulb goes off after a short time   (2mks)

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(iii)   Give **one** method of minimizing the defect that occurs in plate A   (1mk)

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(b) An electrician installed electric wiring in a house and connected the bulbs and the switches as shown in figure 13 below.

State and explain what happens when all the switches are closed (2mks)
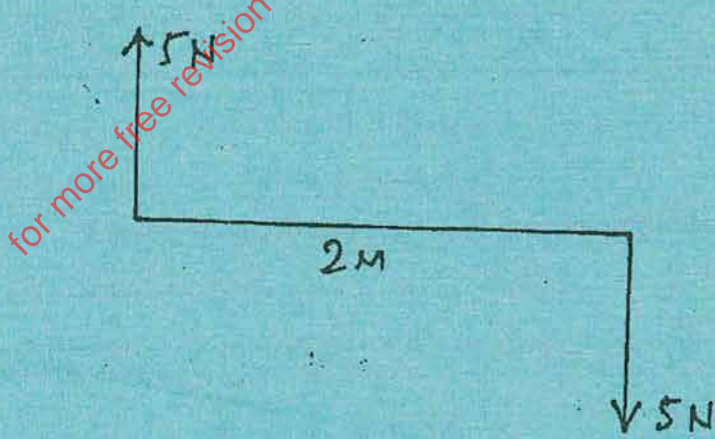
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22.   (a) State **one** factor that affects the turning effect of a force on a body (1mk)

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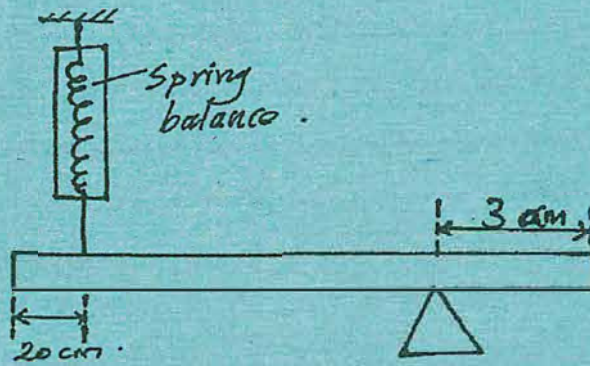
(b) Determine the moment of the couple in figure 14 below (2mks)

(c) Figure 14 below shows a uniform bar of length 1.0m pivoted near one end. The bar is set in equilibrium by a spring balance as shown.

Given that the reading of the spring balance is 1.8N, determine the weight of the bar. (3mks)

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23. (a) State how heat losses by convection and radiation are minimized in a thermos flask.

. (i) Convection (1mk)

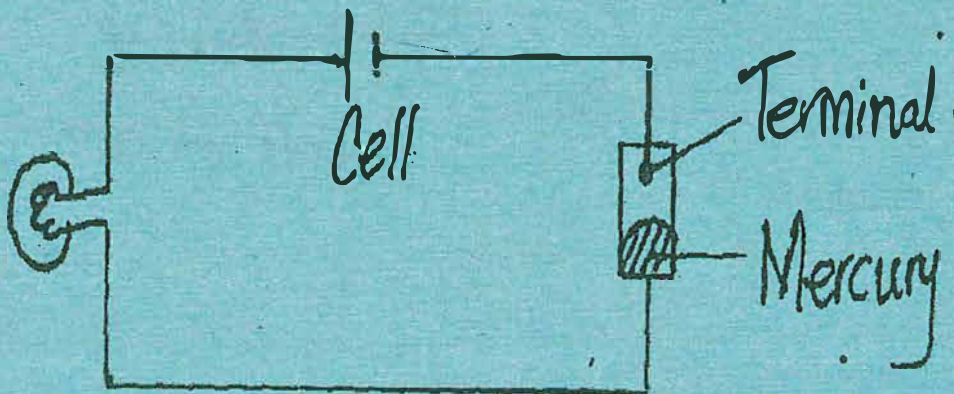..

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(ii) Radiation (1mk)

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(b) What is the role of the constriction in a clinical thermometer? (1mk)

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(c) Figure 15 below shows a simple fire alarm.

· Explain how it works (3mks)

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24.   (a) You are provided with two iron bars, one is magnetized and the other one is not. Describe how one would identify the magnetized bar without using a magnet   (3mks)

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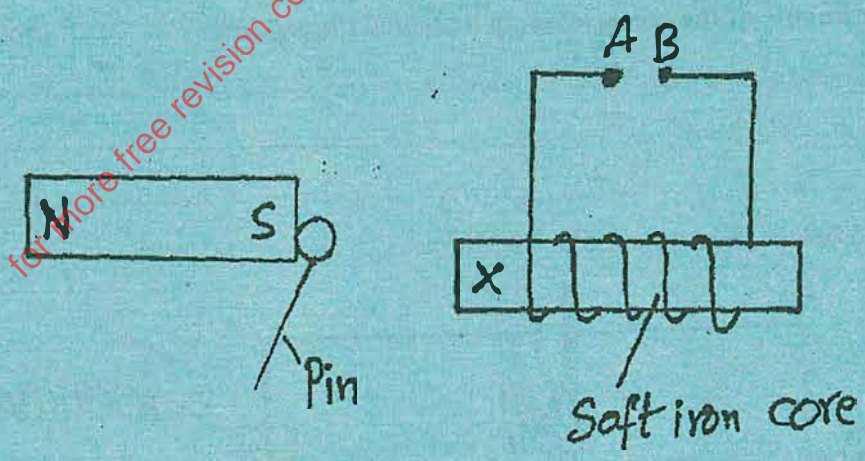(b) Figure 16 below shows an electromagnet placed near a permanent magnet with a pin hung at one end.

FIGURE 16

Identify
(i) Pole X   (1mk)

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(ii) Terminal B   (1mk)

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(c) When an iron bar is hammered severally when it is facing North-South direction it becomes a
weak magnet. Using the domain theory, explain how this is achieved.   (2mks)

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25.   (a) Figure 17 below shows two parallel light rays incident on a concave mirror.
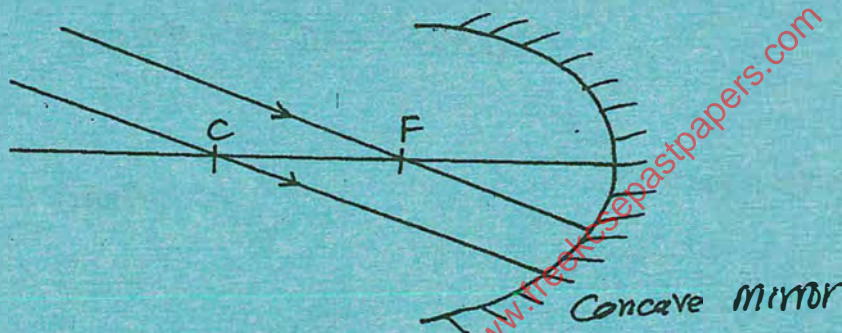

FIG 17

Sketch on the same diagram the path of the rays after striking the mirror and show the image
                                                                                           (2mks)

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(b) Define the term center of curvature.   (1mk)

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(c)   Distinguish between the terms real image and virtual image   (2mks)

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(d) A lady holds a large concave mirror of focal length 80cm, 60cm from her face. State two characteristics of her image in the mirror (2mks)

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26. (a) Figure 18 below shows a force, F, on a conductor carrying current when placed in a magnetic field
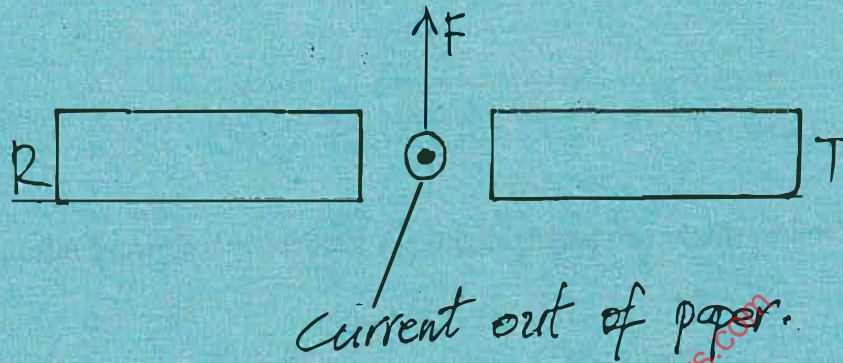

FIG 18

State the polarities R and T (2mks)

R _____

T _____

(b) Figure 19 below shows a motor connected to a magnetic switch called a relay and operated by an ordinary switch S_1
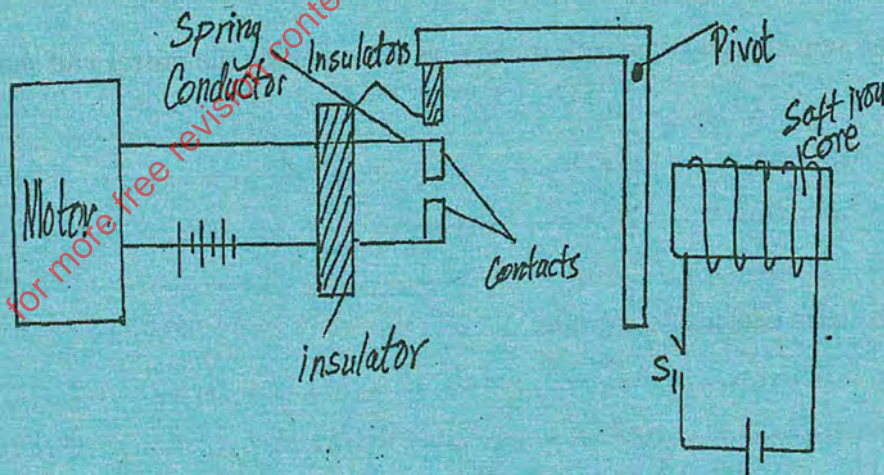

FIG 19

(i) Explain how the relay switches on the motor when S_1 is closed (3mks)

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(ii) State and explain the effect on the motor if the iron core is replaced with a steel core and switch S1 is put on and then off. (2mks)

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27. (a) Define the term elasticity. (1mk)

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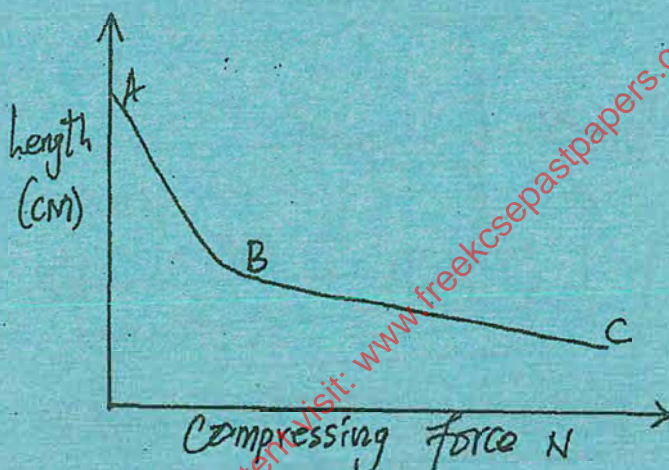(b) Figure 20 below shows a graph of length against stretching force for a spring subjected to forces of compression

FIG 20

(i) Explain the shape of the graph between

I. A and B (1mk)

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II. B and C (1mk)

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(ii) In which section does the graph obey Hooke's law. (1mk)

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(c) A piece of wire of length 20.0m is stretched to a length of 20.4m by a mass of 8kg. Calculate the length of the wire when a weight of 120N is hung from it, assuming that the wire obeys Hooke's law. (3mks)

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28. (a) Distinguish between transverse and longitudinal waves (1mk)

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(b) Figure 21 below, shows a mass attached to a spring such that when it oscillates, it taps on the water surface in a wide shallow tank.
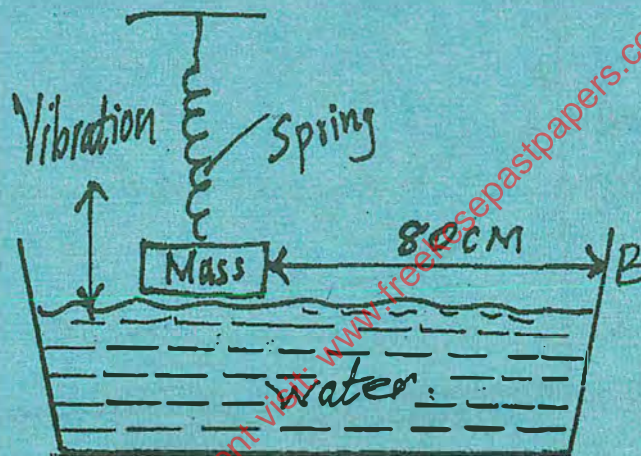The student measured time for 20 oscillations and found that the mass takes 36 seconds.

FIG 21

Determine:

(i) The periodic time of the mass. (1mk)

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(ii) The frequency of the waves produced on the water surface (1mk)

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(c) Explain why the inside of the loud speaker box is covered with cotton material. (2mks)

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