



Name.....Stream.....Adm No.....

F 2-

MARANDA HIGH SCHOOL

Kenya Certificate of Secondary Education

Physics

Term Two Cycle 2

2018, June

Time: 2hrs

Instructions to candidates

This paper consists of two sections – section A and section B

Attempt all questions in the spaces provided

All working must be clearly shown

Non programmable, silent calculators and mathematical tables may be used

Answers to numerical calculations must be expressed in decimal form

Where necessary take: -

Density of water = 1000kgm^{-3}

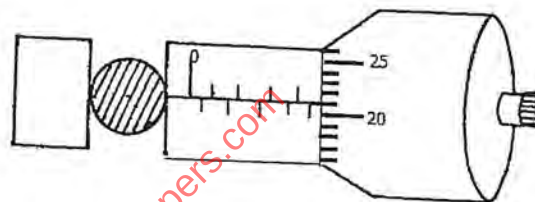
Density of mercury = 13600kgm^{-3}

$g = 10\text{ms}^{-2}$

SECTIONS	QUESTIONS	SCORE
A		
B		

SECTION A

1. A spherical ball bearing of mass 0.0024 kg is held between the anvil and spindle of a micrometer screw gauge. The reading on the gauge when the jaws are closed without anything in between is 0.11mm . Use this information and the position of the scale in the figure below to answer the questions (a) and (b) below



a) What is the diameter of the ball bearing?

(2mks)

b) Find the density of the ball bearing correct to 3 significant figures

(3mks)

2. A crystal of potassium permanganate was carefully introduced at the bottom of water column held in a gas jar. After sometime, the whole volume of water was colored. Explain this observation.

(2mks)

4 (a) State the principal of moments.

(1mks)

(b). The figure1shows a uniform rod of mass 150g and length 900mm supporting two loads as shown shown. At what distance from the 48g mass should a pivot be placed for the system to remain in equilibrium.

(3mks)

figure.1



5. Define the following terms as used in curved mirrors

a) principal focus

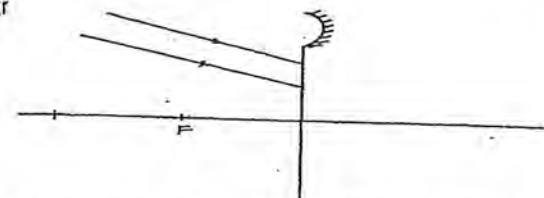
(2mks)

b) Radius of curvature

(1mks)

6. Figure 2 below shows two rays from a far away object incident on a concave mirror whose principal focus is F.

On the same diagram



e mirror.

(2mks)

7. Other than local action name the other defect of simple cells and explain how it can be corrected

(2mks)

8. A sphere of diameter 2.45cm molded into a thin uniform wire of diameter 0.26mm, calculate the length of the wire in meters. (Take $\pi = 3.142$)

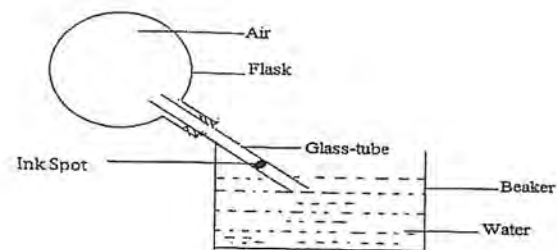
(3mks)

9. The figure 4 shows a thermometer used by a doctor to determine the temperature of a patient. Why is it difficult to work with this thermometer? (1mks)



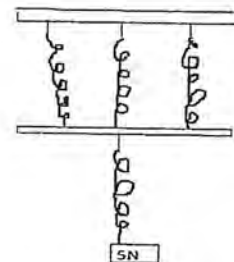
10. State ONE advantage of thermal expansion in solids using relevant examples. (1mks)

11. The figure 5 shows a flask fitted with a glass tube dipped into a beaker containing water at room temperature.



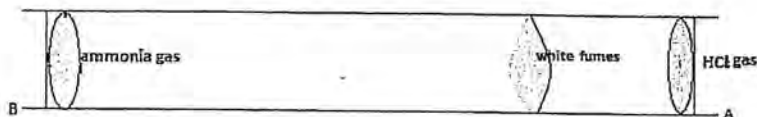
- State with a reason what would be observed if cold water is poured on to the flask (2mks)

12. The springs shown below are all identical. When a force of 15N is applied on each spring, it extends by 8cm.



- Determine the extension of the system shown in the figure (Weight of the springs and the rod is negligible) (3mks)

13. Two pieces of cotton wool were soaked, one with ammonia solution and the other with concentrated hydrochloric acid. They were placed at the end of glass tube as shown below.



In the same test tube indicate with an arrow where the white deposit will be formed if the temperature of end B is lowered and that of end A maintained as before. Give reason of why the white fumes is formed at that point you have indicated. (2mks)

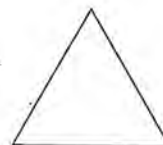
14. (a) In an experiment on static electricity, the gold leaf of a negatively charge electroscope was observed to fall then rise when a strongly positively charged polythene rod was gently lowered towards it. Explain this observation. (2mks)

(b) Give a reason why the caps of the cells of a lead acid battery are opened when charging the battery (1mk)

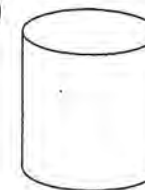
15. Sketch a graph showing how volume of pure water varies with temperature from 0°C to 10°C (2mks)

16. Locate the center of gravity of the following objects showing clearly the steps (4mks)

a)



b)



17 The figure below shows a bar magnet placed near one end of a current carrying coil



If the coil is attracted to the magnet, indicate the direction of the current in the coil (1mk)

(b) One common type of magnet that is preferred to permanent magnet is electromagnet.

(i) Define the term electromagnet.

(1mks)

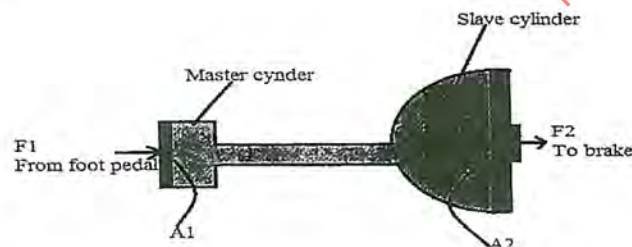
(ii) State two ways of increasing the strength of an electromagnet.

(2mks)

(c) State two uses of a magnet

(2mks)

18. a) The figure 8 shows part hydraulic brake system. Use it to answer the following questions.



Given that $A_1=300\text{cm}^2$, $A_2=900\text{cm}^2$ and $F_1=60\text{N}$

Calculate pressure in the fluid due to F_1

(2mks)

(b) Calculate the force on the piston in slave cylinder

(2mks)

(c) Give the condition under which the system above operates

(1mks)

(d) State ONE property of the fluid used in the hydraulic brake system

(1mks)

e) Given that there is a decrease in air pressure of $1.4 \times 10^3 \text{Pa}$ fore very 98m increase in altitude, determine the density of air.

(3mks)

f) Explain the reason why one from low altitude areas is likely to experience nose bleeding on tops of mountain. (2mks)

19.a) In an experiment to estimate the diameter of an oil molecule, an oil drop of diameter 0.05cm spreads over a circular patch whose diameter is 20cm.Determine;

i)The volume of the oil drop (2mks)

ii)The area of the oil patch covered by the oil (2mks)

iii)The diameter of the oil molecule (3mks)

b) State two possible sources of errors in this experiment (2mks)

20. (a) what is meant by the centre of gravity of a body? (1mks)

(b) Fig 8 shows two identical hollow spheres. Sphere A is completely filled with the liquid while B is partially filled with identical liquid.

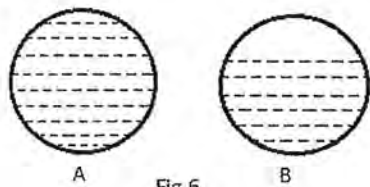


Fig 6

When the two spheres are rolled gently on a horizontal surface, it is observed that the sphere B stops earlier than the sphere A. Explain this observation. (2mks)

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(c) State two conditions for a body to be in equilibrium. (2mks)

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(d) Fig 7 shows a uniform cuboids block of mass 800g on which a weightless 70cm long wooden plank is fixed.

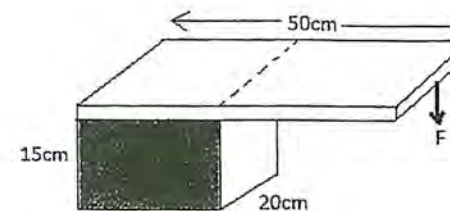


Fig 7

If the cuboids block is of dimensions 30cm x 20cm x 15cm. find the minimum force F applied at the end of the plank as shown, to tilt the cuboids block. (3mks)

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(e) State two factors affecting the stability of a body. (2mks)

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21. A student heated an equal amount of water in aluminum containers, by a flame of equal hotne
If, one of the container was bigger than the other, swchich will take longer time to boil water and wh
(2marks)

22. A uniform mixture consists of 30cm^3 of water and 40cm^3 of ethanol. If the densities of
water and ethanol are 1g/cm^3 and 0.85g/cm^3 respectively. Determine the density of the
mixture. (3mks)