PHYSICS FORM ONE 2017

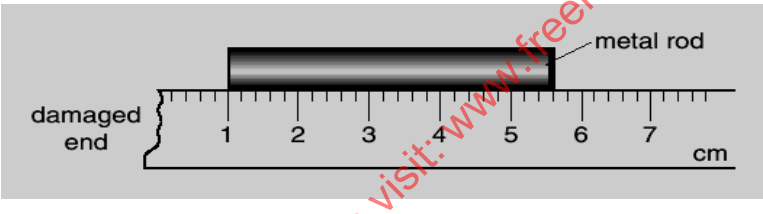
Instructions to candidates

- ✓ Write your name and class in the spaces provided above.
- ✓ This paper consists of **TWO** sections; **A** and **B**.
- ✓ Answer **ALL** the questions in section A and B in the spaces provided after each question.
- ✓ **ALL** working **MUST** be clearly shown.
- ✓ Non-programmable silent electronic calculators and KNEC mathematical tables may be used.

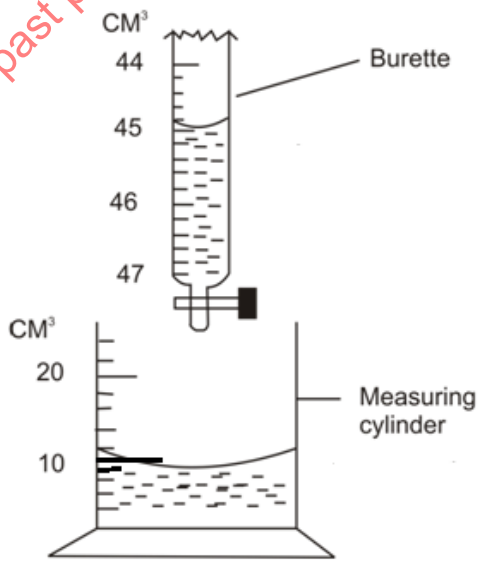
Take: Acceleration due to gravity g = 10 ms^{-2} Density of water = 1000 Kg/m^3

SECTION A(25 marks)

1.A girl uses a damaged rule to measure the length of a metal rod. She places one end of the rod at the 1 cm mark as shown. How long is the metal rod? **[1mk]**



2. The figure below shows a measuring cylinder and a burette containing some water.

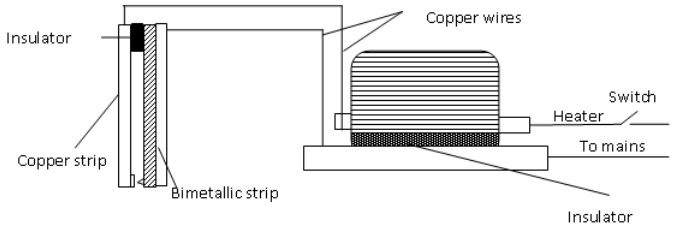


$2cm^3$ of water was added in the cylinder from a burette. Record in the spaces provided below the new readings indicated in each vessel**(2mks**)

measuring cylinder----------

Burette----------

3.The Figure below shows a circuit diagram for controlling the temperature of a room.



Explain how the Bimetallic strip control the temperature. **(2mk)**

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4. Water is known to boil at 100^0C. A student heated some water and noticed that it boiled at 101^0C. State two possible reasons for this observation. **(2mks)**

5. What the property of light which is suggested by the formation of shadows? **(1mk)**

6. In the set up shown in figure 3, water near the top of the boiling tube boils while at the bottom it remains cold.

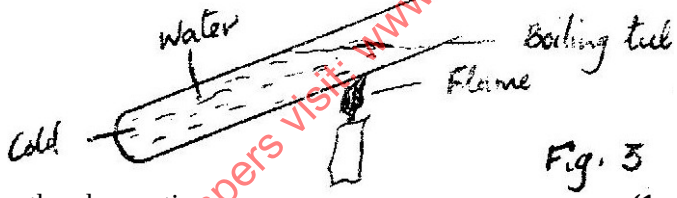


Fig. 3

Give a reason for the observation **(1mk)**

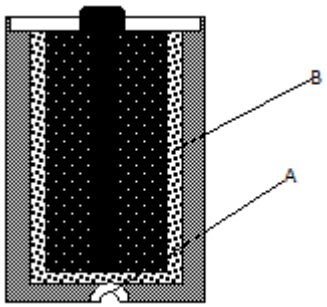
7. Small gaps are left in railway lines as shown below.

Explain why the gaps are needed**[1]**

8. A tall container has two holes one at the middle and the other near the bottom. Both holes are initially closed with plasticine. Both holes have equal diameter. Which hole is more likely to open when the container is filled with water? Give a reason for your answer**.(2mks)**

9. Give a reason why it is dangerous to smoke a cigarette near a charging battery **(2mk)**

10. The figure below shows the features of a dry Lĕclanche cell.



i) State the polarity of the part labeled A. **(1mk)**

ii) State the role of the chemical substance B **(1ms)**

11. State two disadvantages of using a pinhole camera in taking photographs compared to the modern lens camera**.(2mks)**

12. Electroscope has a metal casing .State its use**.(1mk)**

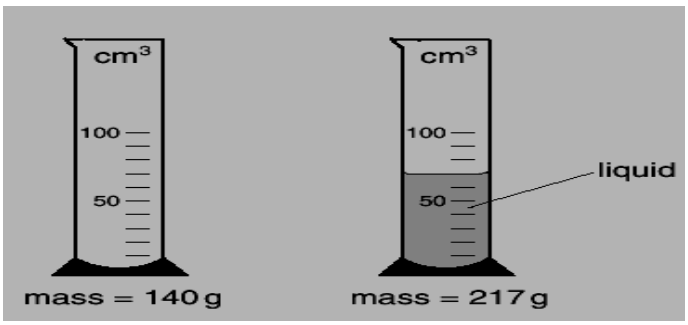
13. Name two defects suffered by a simple cell and how each is minimized in primary cells **(2mks).**

14. Explain the following observations.

(i)Brownian motion is demonstrated by small particles**. (1mk)**

(ii)When solids are heated they expand **(1mk)**

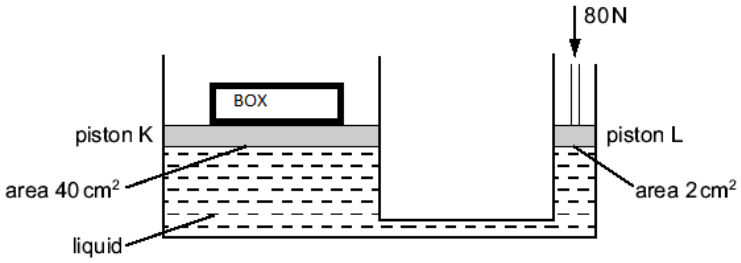
15. Masses of a measuring cylinder before and after pouring some liquid are shown in the diagram. What is the density of the liquid?**[2mks]**



SECTION B(55Marks)

16(a) Explain why brakes of a vehicle fail when air enters in the brake pipes**(2mks)**

(b)In the figure below, the pressure of the liquid due to force of 80N is able to lift a box.



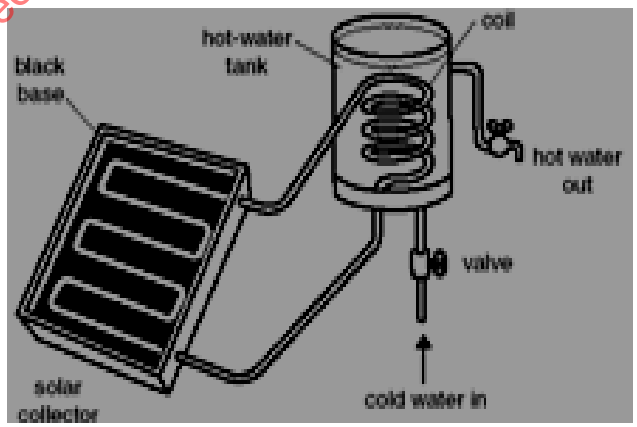
(i)Find the pressure at piston L in N/m^2**.(1mk)**

(ii)Find the weight of the box which can be lifted by the 80N force **(2mk).**

(iii)Find the mass of the box **(1mk)**

(c)Explain why liquid is used in hydraulic system instead of gas**(2mks)**

17. The figure below shows equipment placed on top of a house that uses solar energy to produce hot water.



(a) Explain why the solar collector has a black base**. [2mks]**

(b) State and explain why the hot water travels to the hot-water tank. **[2mks]**

(c) The equipment does not show any insulation.

(i) Explain why it is important to insulate the hot-water tank**.[1mk]**

(ii) Explain how the hot-water tank is insulated. **[1mk]**

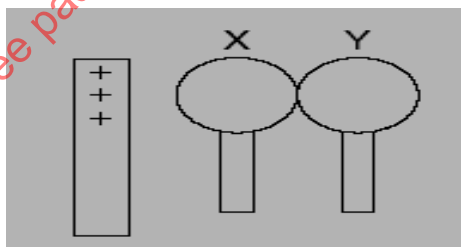
18.(a)A shoe is polished and it attracts dust immediately.

(i)Explain why the shoe attracts dust **(2mks).**

(ii)state how to prevent dust attraction by the shoes**.(2mks)**

(b)An oil tanker is normally discharged through earthing facilities before off-loading. Explain**.(2mks)**

(c) Two metal spheres X and Y are in contact with each other. The spheres are supported on insulated handles.

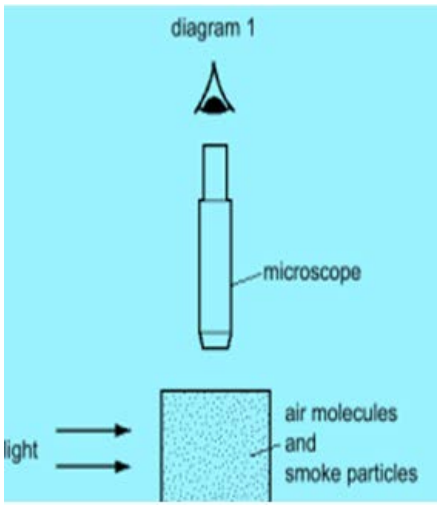


If a positively charged rod is brought near sphere X;

(i) State the types of charges on sphere X and Y **(2mks).**

(ii)Explain how the charges in (i) above are acquired permanently **(2mks).**

19. Brownian motion of smoke particles can be studied by using the apparatus shown in Diagram1..



(a)Explain the role of;

(i) The smoke particles**(1mk)**

(ii) light **(1mk)**

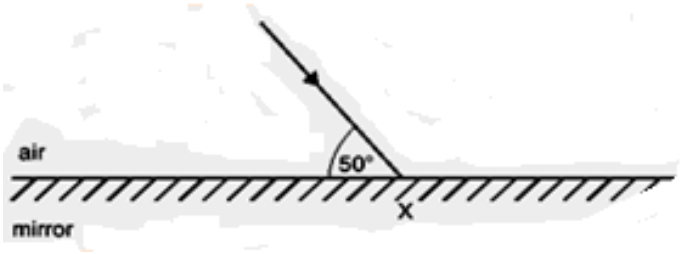
(iii) microscope**(1mk)**

(b)State and explain the nature of the observed motion of the smoke particles**.(2mks)**

(c)State what will be observed about the motion of the smoke particles if the temperature surrounding the smoke cell is lowered**.(2mks)**

(d)What conclusion can be made from this experiment? **(1mk)**

20. The figure below shows a ray of light incident on a mirror at X. The incident ray makes an angle of 50° with the surface of the mirror.



(a) Complete the above figure to show the normal and the reflected ray at X. **[1mk]**

(b) State the values of:

i)the angle of incidence, **[1mk]**

ii)the angle of reflection.**[1mk]**

(c)Two mirrors are inclined at an angle of 60^0 toward each other. A candles is placed at equal distance between the mirrors. Calculate the number of images observed.**(2mks)**

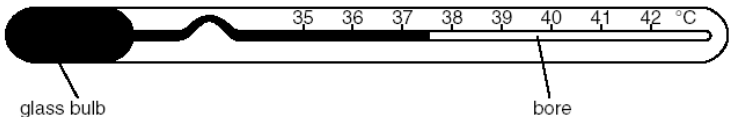
21. A form one student placed a steel needle carefully on the surface of water in a tray .He noted that it floated.

(i)Explain this observation, giving reason why the needle floated **(2mks).**

(ii)State three ways that may be applied to ensure that it sinks**.(3mks).**

(iii)Name the force which cause the needle float in water**.(1mk).**

22. A clinical thermometer is designed to respond quickly to a change in temperature and to have a high sensitivity.



(i)Where do you think the clinical thermometer should be used?**(1mk)**

(ii)Which liquid is in the glass bulb **(1mk)**

(iii)State three special features of the clinical thermometer **(3mk)**

(iv)Explain why it has a range of 35^{o} c to 42^{o} c **(2mks)**

(v)Explain why clinical thermometer should not be sterilized using boiling water.**(2mks)**

(vi)State any liquid which can be used to sterilize clinical thermometer **(1mk).**