

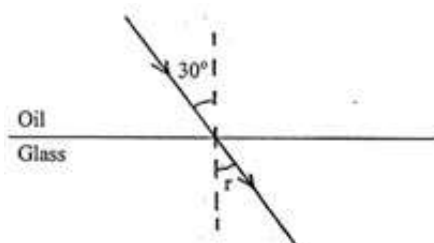
FORM FOUR CLUSTER KCSE MODEL8

PHYSICS PAPER 2 QUESTION

SECTION A (25 Marks)

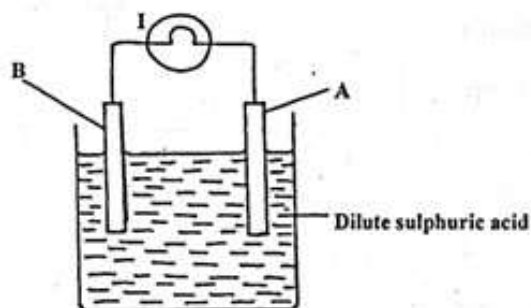
Answer all questions in this section

1. Give a reason why sharp projections are provided on the wing and tail of an aeroplane.
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2. The coil of an electric motor is usually wound on a soft iron armature. State the purpose of soft iron armature.
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3. The diagram below shows a ray of light incident on a glass –oil interface.



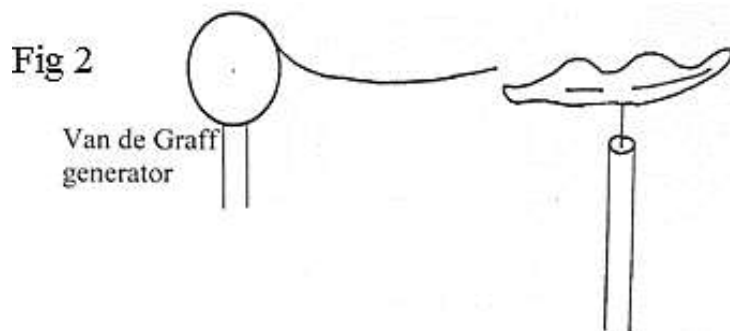
If the relative indices of oil and glass are $\frac{6}{3}$ and $\frac{3}{2}$ respectively, determine the value of r .

4. The figure shows a simple cell.



Use the information on the figure to answer the questions below. (1mk)

- a) Name the parts labeled A and B. A.....
 - b) It is observed that the bulb goes off after a short time. Explain this observation. (2mks)
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5. A lit candle is placed near the sharp point of a pin which is connected to positively charged van de Graaff generator the flame is split into two directions when the generator is working as shown in the figure 2 below.



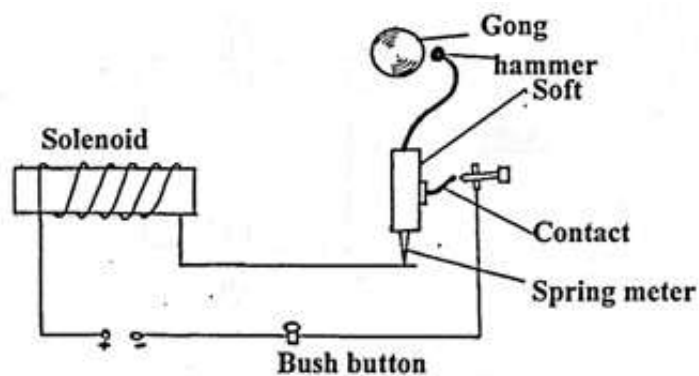
Explain the observation (2mks)

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6. The figure shows a simple circuit diagram of an electric bell.



Explain how it works

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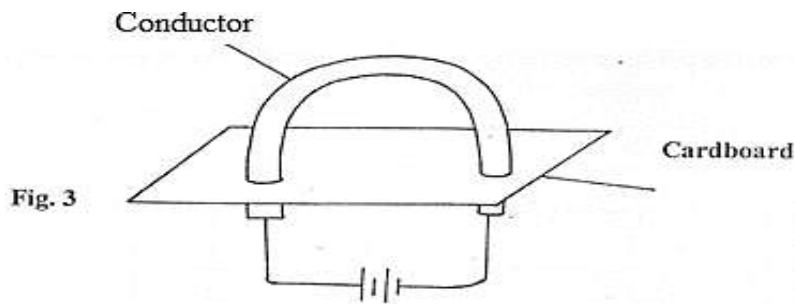
7. Explain why a rubber balloon, if rubbed will often stick to the wall.

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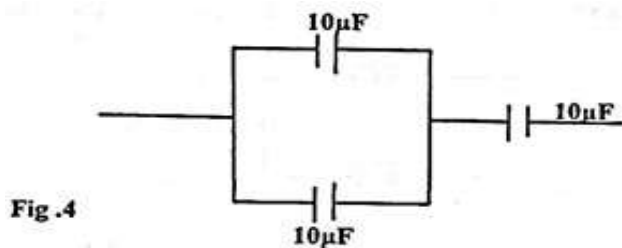
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8. Fig 3.Below shows a current carrying conductor, indicate the direction of current in the conductor hence the magnetic field pattern.

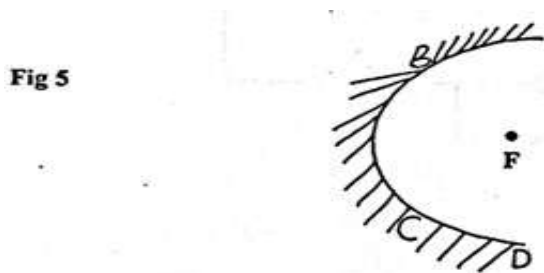


9. Three capacitors of capacitance $10\ \mu\text{F}$ are arranged as shown.



Find the effective capacitance.

Figure 5 is a parabolic surface with a source of light placed at its point F. Draw rays to show reflection from the surface when rays from the source strike the surface at point B C and D.



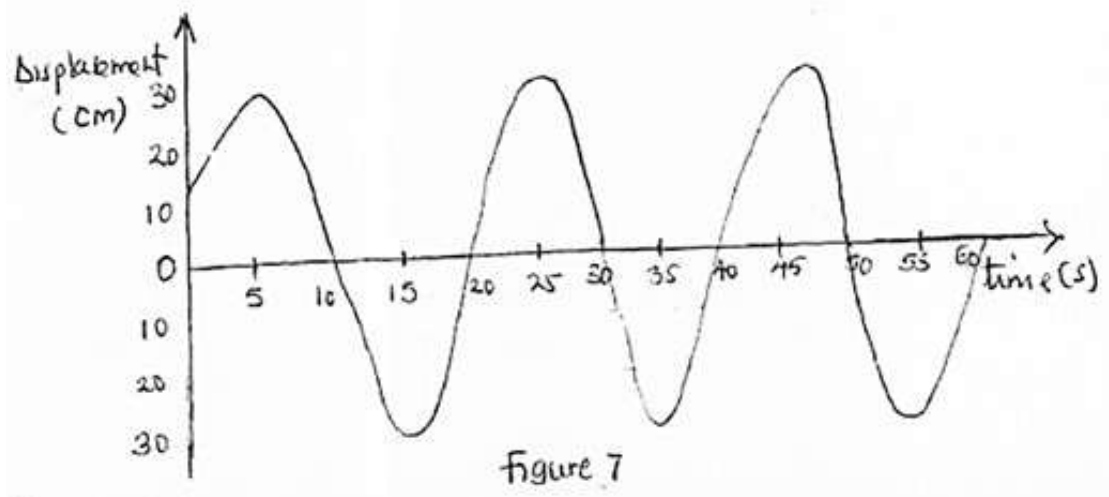
10. State two factors that cause light to bend as it travels from one medium to another.

11. State two factors that affect resistance of a metallic conductor.

SECTION B (55 Marks)

Answer all questions in this section

12. a) Figure 7 shows a displacement – time graph for a progressive wave.



i) State the amplitude of the wave. (1mark)

ii) Determine the frequency of the wave. (4marks)

iii) On the same figure, sketch a wave of half the amplitude and double the frequency. (2marks)

b) Figure 8 shows plane waves incident to a slit.

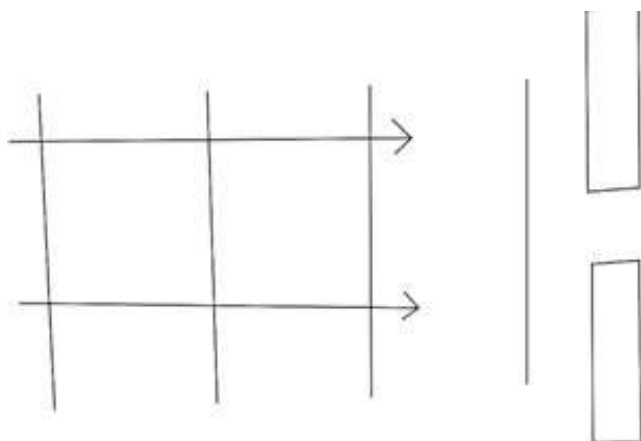


Figure 8

Complete the diagram to show the pattern across the slit. (1mark)

ii) State what will be observed on the waves across the slit when;

i. The slit is made very large (1mark)

.....

ii. The slit is made very small (1mark)

.....

13. Figure 9 shows a ray of monochromatic light incident to a transparent rectangular block.

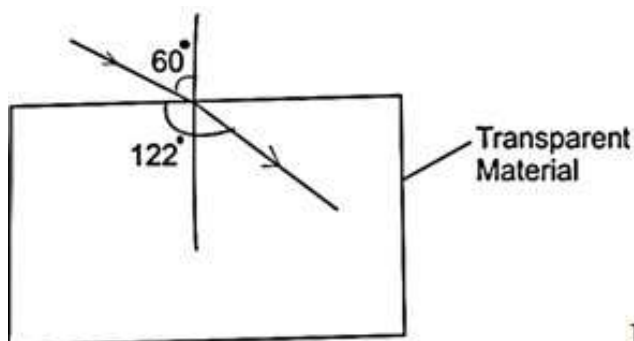


Figure 9

Determine
i) The angle of refraction (1mark)

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ii) The refractive index of the transparent material. (3marks)

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iii) The critical angle of the transparent material. (3marks)

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b) On the same diagram, draw the direction of the ray until it emerges out of the block. (3marks)

c) What do you understand by the term monochromatic light? (1mark)

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14. a) Figure 10. Shows two uncharged spherical balls suspended on dry cotton threads and a charged polythene rod brought near A.

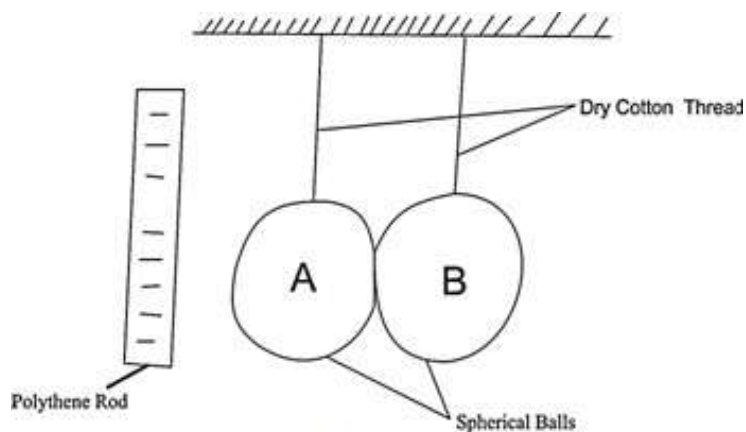


Figure 10

- Indicate the charges on both spheres. (2marks)
- The spheres are finally separated as in figure II

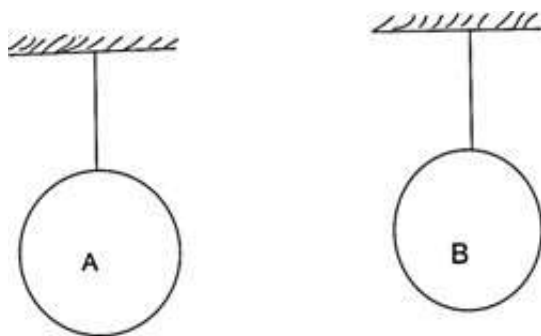


Figure 11

Indicate the charge distribution in A and B. (2marks)

- Figure 12 shows capacitors A and B connected in series with a battery of emf 10V

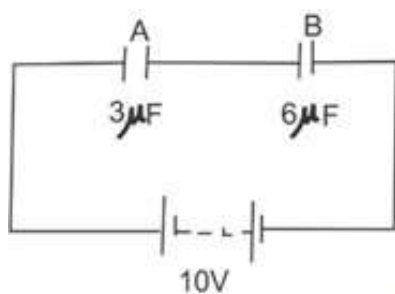


Figure 12

Determine;

- The effective capacitance of the circuit. (3marks)

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ii) The quantity of charge in the capacitor A. (3marks)

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iii) The quantity of charge in capacitor B (1mark)

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c) State two factors that determine the capacitance of a parallel plate conductor. (2marks)

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15. a) Define the term focal length as used in thin lenses. (1mark)

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b) Figure 13 shows an object placed at F on the principal axis of a converging lens.

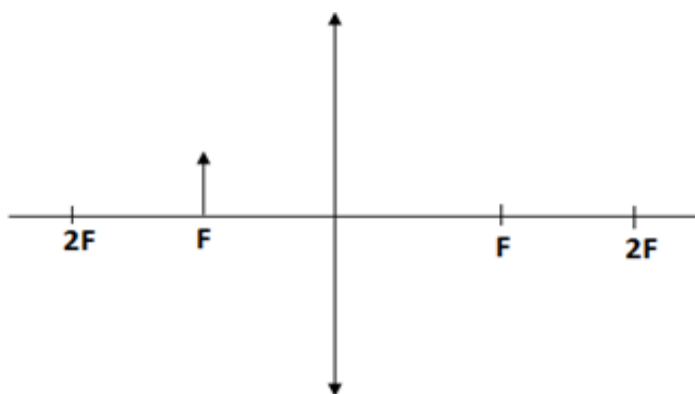


Figure 13

Draw ray diagrams to show how the image may be formed. (2marks)

c) A vertical object is placed 20cm in front of a convex lens of focal length 5cm.

i) Determine,

I. The image distance (3marks)

II. The magnification (3marks)

ii) State two characteristics of the image formed. (2marks)

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16. a) Long distance transmission of power is done at a very high voltage. Explain. (1mark)

b) Figure 14 shows a section of a house wiring system.

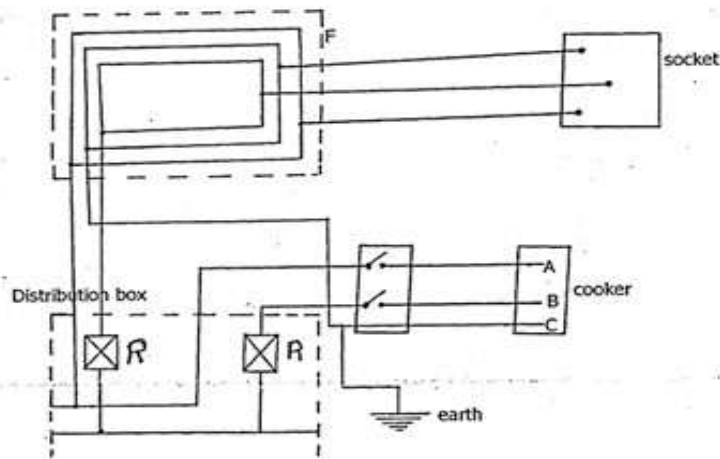


Figure 14

i) Name: I.

The circuit labeled F (1mark)

II. The terminals A and B (2marks)

A.....

B.....

ii) Give a reason why R is connected to B and not A (1mk)

iii) What is R (1mark)

iv) Why is earthing necessary in such a circuit? (1mark)

c) 54kg of water in a metallic cylinder of heat capacity 9000JK^{-1} is heated from 10°C to 80°C using an immersion heater rated 1800W, 240V. Assuming that no heat is lost to the surrounding and the immersion heater works at its correct voltage.

Find; i) The current flowing through the water. (2marks)

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ii) The cost of heating the same mass of water from 100C to 800C,
every day for 30 days if electricity cost Sh. 6.70 per unit. (2marks)

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