

FORM FOUR CLUSTER KCSE MODEL5

PHYSICS PAPER 2 QUESTIONS

SECTION A (25 Marks)

Answer all the questions

1. Figure 1 shows an object, O being viewed using two inclined mirrors M1 and M2 parallel to each other.

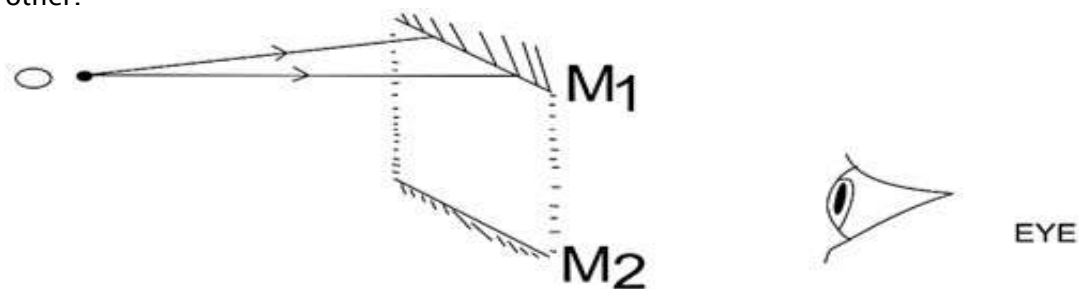


Figure 1

Complete the diagram by drawing the rays to show the position of the image, I as seen by the eye.

2. A positively charged conductor is slowly brought near the cap of a charged electroscope. The leaf first collapse and then diverges. State the charge on the electroscope.

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3. State two advantages of an alkaline cell over a lead acid cell.

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4. Figure 2 shows the magnetic field pattern between poles P and Q of magnets.

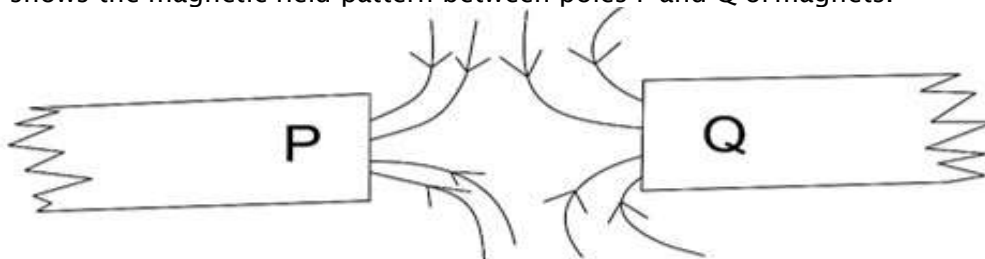


Figure 2

- i) Identify the poles P and Q.

P.....

Q.....

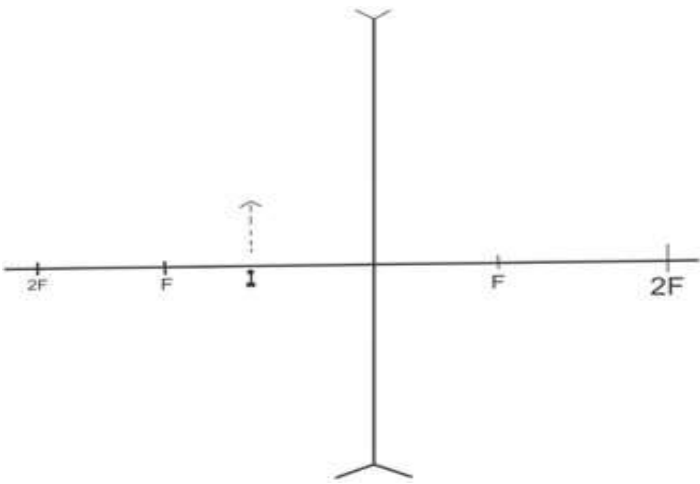
- ii) State with a reason which pole is stronger.

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5. The frequency of an electromagnetic wave is $5.0 \times 10^6 \text{ Hz}$. Determine its wavelength. (Take speed of light as $3.0 \times 10^8 \text{ ms}^{-1}$)

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6. Figure 3 shows the image, I formed when an object is placed in front of a concave lens.



Use suitable rays to locate the position of the object.

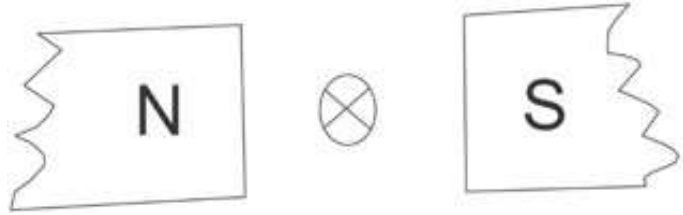
7. A battery circulates charge round a circuit for 1.5 minutes. What quantity of charge flows through the circuit if current is held at 2.5A?

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8. State one advantage of generating a.c. rather than d.c in power generating stations.

.....

9. Figure 4 shows a current carrying conductor placed between poles of strong magnets.



i) Sketch the magnetic field pattern between the poles.

ii) Indicate the direction of force on the conductor.

10. State one condition under which Ohm's law is obeyed in a metal conductor.

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11. Figure 5 shows a graph of relationship between the attractive force of an electromagnet and magnetizing current.

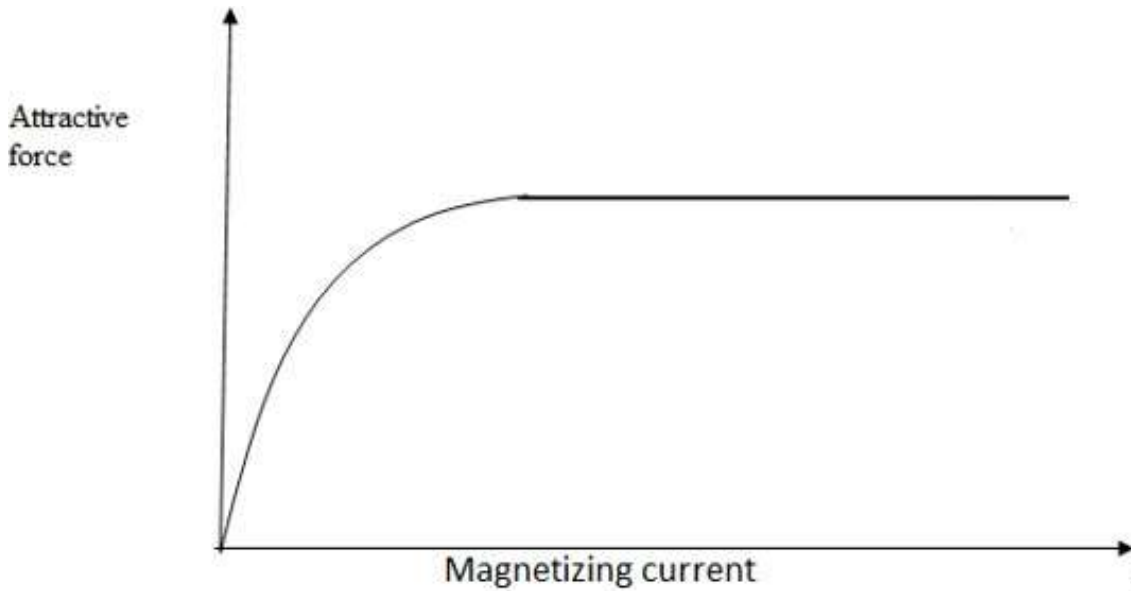


Figure 5

Explain the shape of the curve in terms of the domain theory.

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12. State one disadvantage of using convex mirrors as driving mirrors.

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13. Figure 6 shows water waves moving from a source, S.

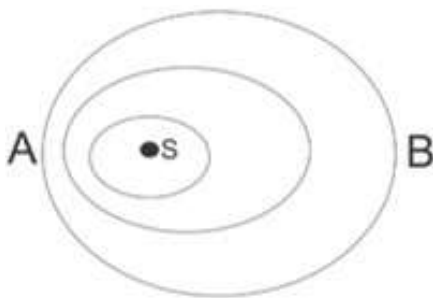


Figure 6

State with a reason which side is deeper.

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SECTION B (55 Marks)

Answer all questions

14. a) Figure 7 shows a displacement - time graph for a progressive wave.

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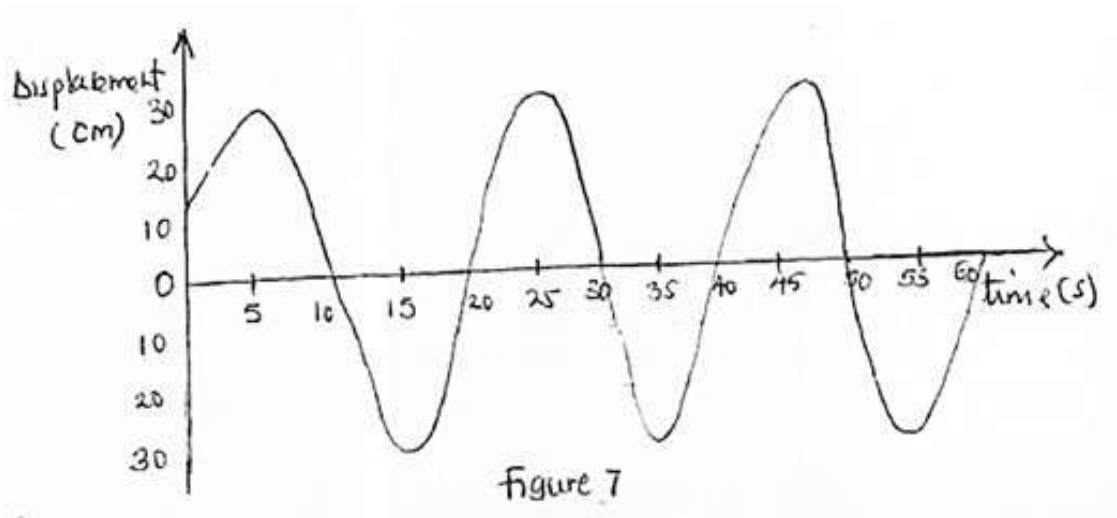


Figure 7

i) State the amplitude of the wave.

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ii) Determine the frequency of the wave.

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

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

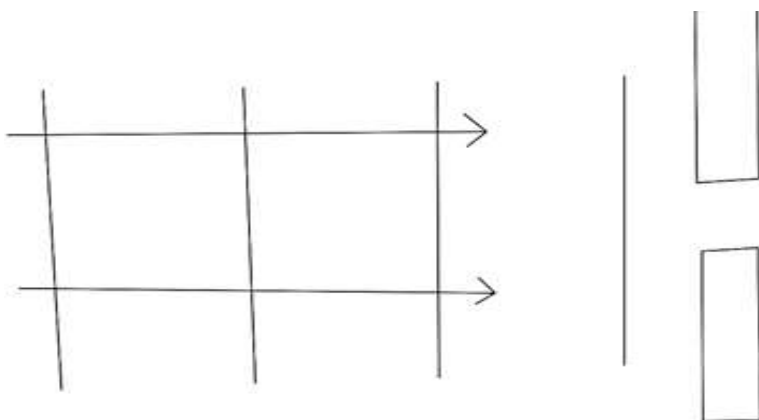


Figure 8

i) Complete the diagram to show the pattern across the slit.

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

i. The slit is made very large

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ii. The slit is made very small

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

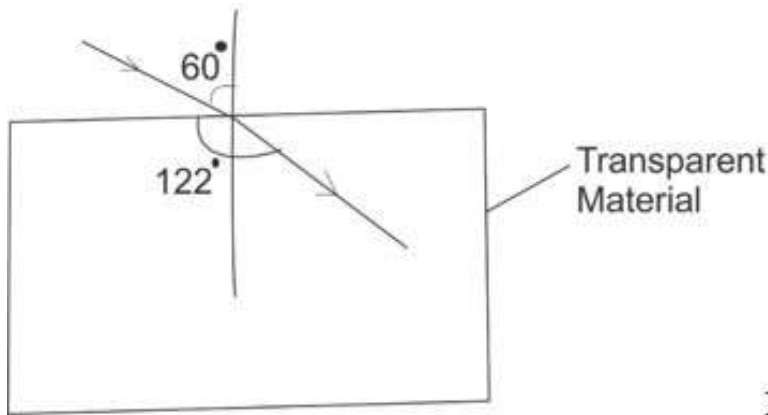


Figure 9

Determine

i) The angle of refraction

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ii) The refractive index of the transparent material.

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iii) The critical angle of the transparent material.

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

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

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

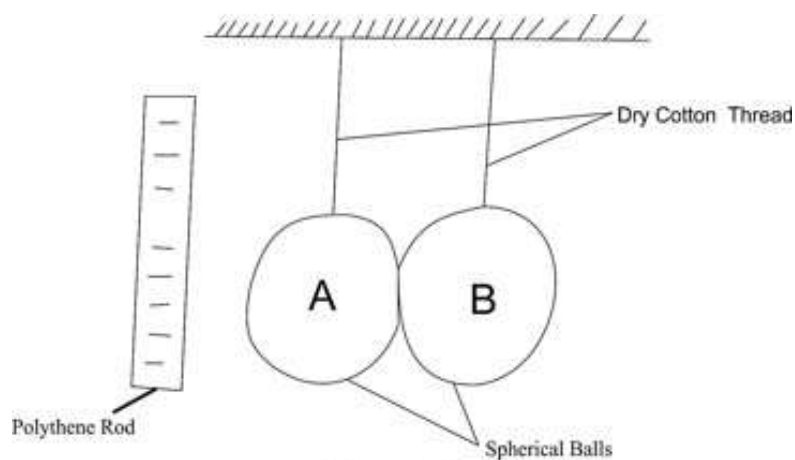


Figure 10

- i) Indicate the charges in both spheres.
ii) The spheres are finally separated as in figure II

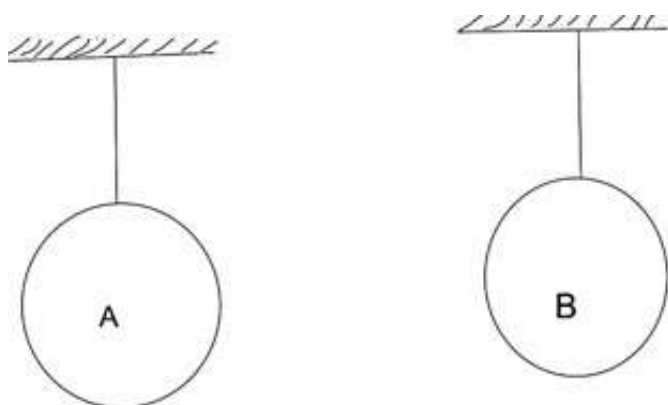


Figure 11

Indicate the charge distribution in A and B.

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

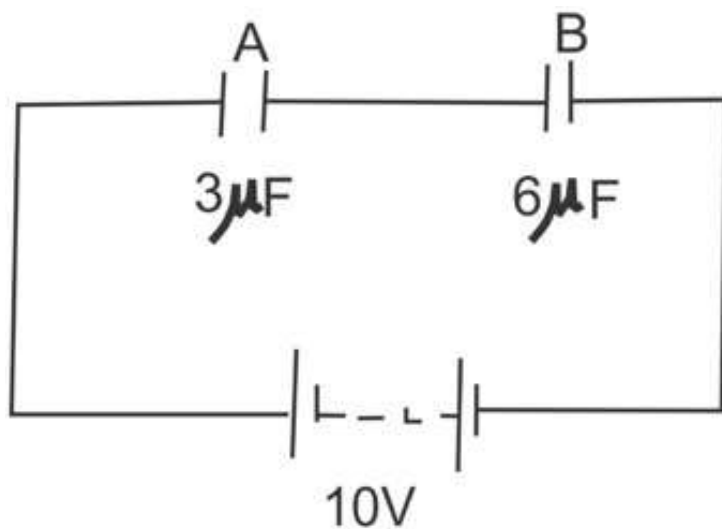


Figure 12

Determine;

i) The effective capacitance of the circuit.

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ii) The quantity of charge in the capacitor A.

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iii) The quantity of charge in capacitor B

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

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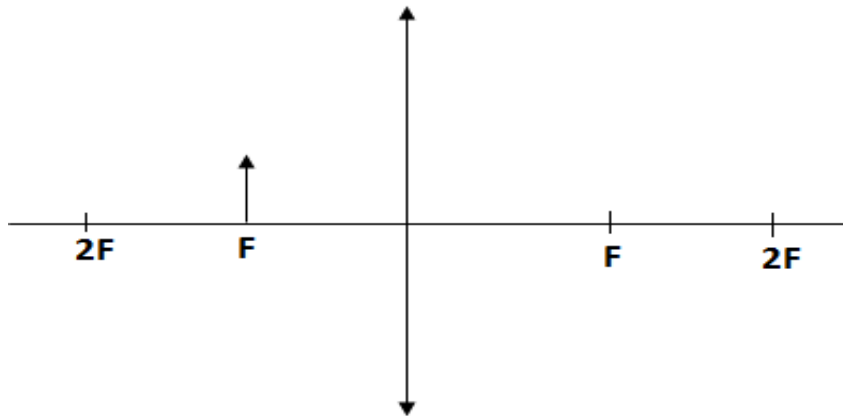
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17. a) Define the term focal length as used in thin lenses.

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



Draw ray diagrams to show how the image may be formed.

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

i) Determine,

I. The image distance

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II. The magnification

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ii) State two characteristics of the image formed.

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18. a) Long distance transmission of power is done at a very high voltage. Explain.

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

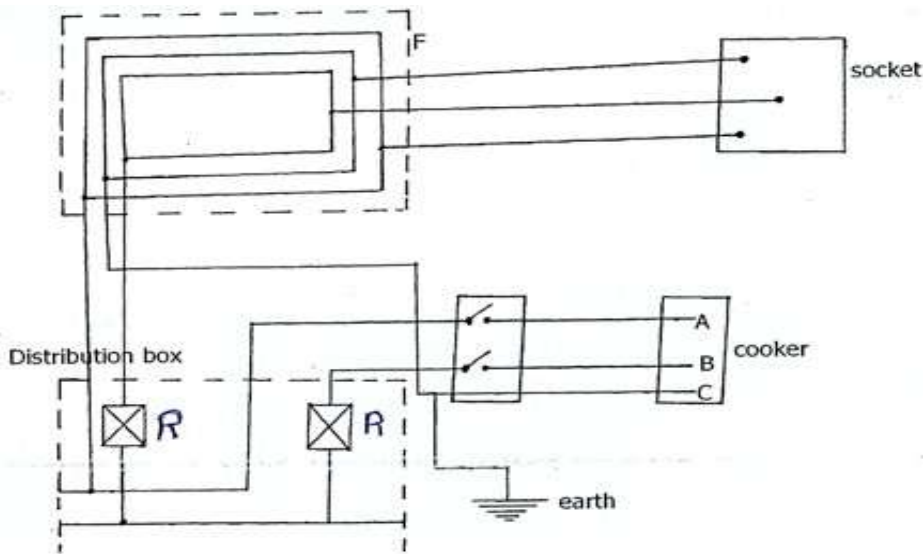


Figure 14

i) Name:

I. The circuit labeled F

.....

II. The terminals A and B

A.....

B.....

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

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.....

iii) What is R

.....

iv) Why is earthing necessary in such a circuit?

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c) 54kg of water in a metallic cylinder of heat capacity 9000JK^{-1} is heated from 100°C to 800°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.

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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.

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