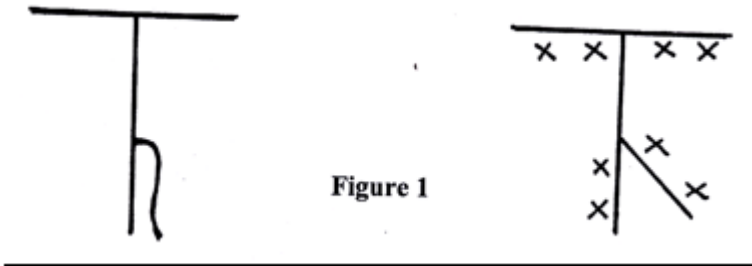


KCSE CLUSTER TESTS 11

Physics Paper 2

SECTION A (25 Marks)

1. **Figure 1** shows two identical electroscopes, the one on the right is charged but the one on the left is not.



Show the charge distribution after the capes of the two electroscopes are connected by a thin conducting wire.

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1 marks

2. State one condition necessary for producing interference of sound waves.

.....
.....

1 marks

3. The **figure 2** shows a simple cell made of copper and zinc electrode dipped in dilute sulphuric acid.

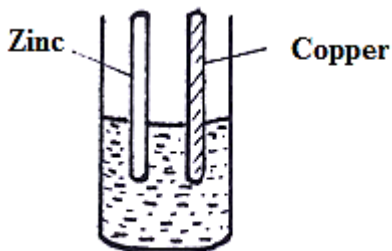


Figure 2

a) Identify the cathode and anode.

Cathode:

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.....

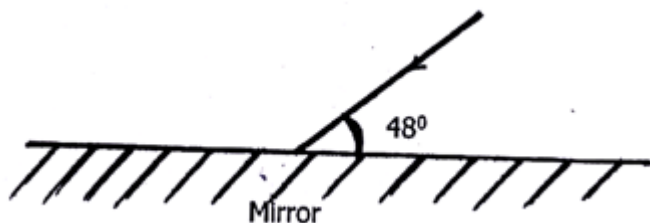
Anode :

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.....

b) State the two common defects in a simple cell

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4 marks

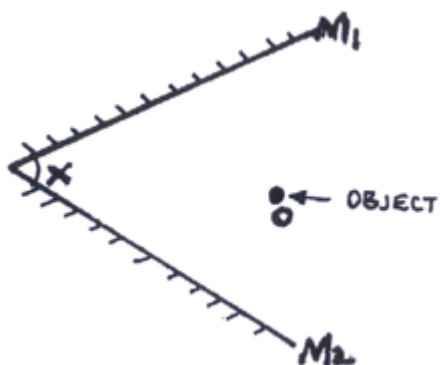
4. The figure 3 shows a ray of light incident on a mirror.



Determine the angle of reflection when the mirror is rotated 200 anticlockwise.

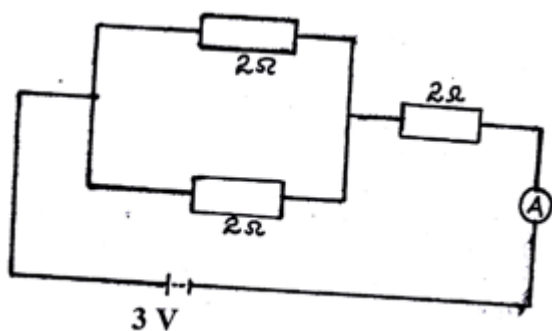
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2 marks

5. The figure below shows two plane mirrors inclined at an angle x . from each other. A viewer counts a total of seven images by looking directly from the object O. Determine value of x .



2 marks

6. Determine the ammeter reading in the figure 5 below.

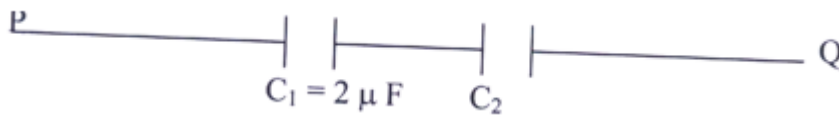


2 marks

7. Find the cost of using a 3 Kw immersion heater and five 75 w electric bulbs for a day if the price per unit (Kwh) is 80cts

3 marks

8. The figure 6 below shows part of the circuit containing two capacitors C1 and C2.



If $C_1 = 2 \mu F$ and the Pd a cross PQ is 150V while the total charge in the capacitors is 1.8×10^{-4} coulombs. Determine the value of C2.

3 marks

9. A form 4 student observed that his grandfather positions a book from his eyes when reading it. Explain the type of lenses that the student should advice his grandfather to wear.

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2 marks

10. Explain how earth wire provides safety in an electrical installation (1mark)

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.....
.....

1 marks

11. Describe with the aid of labeled diagram an experiment to determine the focal length of a lens when provided the following –an illuminated object, a convex lens, a lens holder, a plane mirror and a meter rule.

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3 marks

12. State one difference between a virtual image formed by a plane mirror and that formed by a concave mirror.

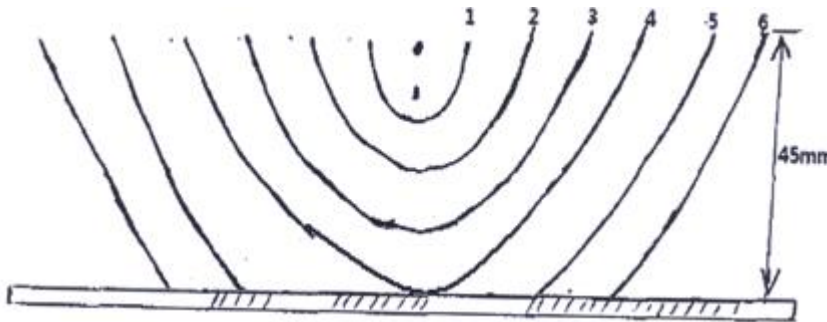
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1 marks

SECTION B (55 Marks)

13. a) A vibrating source S produces circular water waves near, a straight reflector as shown in

Fig 7.



i) Copy and complete the diagram to show how crest 5 and 6 are reflected.

.....

ii) From the figure determine the wavelength of the water waves.

.....

iii) Find the frequency of the waves if their speed is 60mm/s

.....

b) The figure below shows a simple diagram of an eye as shown in **Fig 8.**

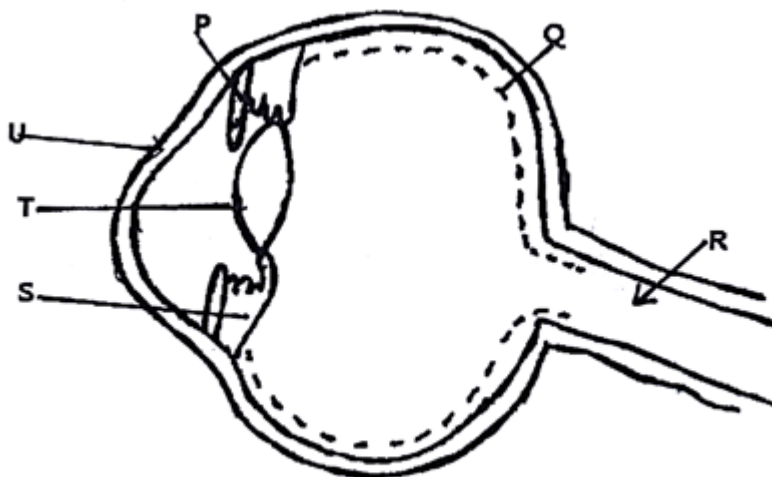


Figure 8

(i) Identify the following parts of the eye indicating the letters against them. The cornea: The Retina:

(ii) A person enters a brightly lit room from a dark corridor.

1. State the effect on the pupil of the eye.

.....

II. How does this affect the amount of light entering the eye?

.....

(iii) **Copy and complete** the table below.

Part of the eye	Description
	Sensitive to light
	Carries to light
	Alter the size of the pupil

(iv) A normal eye is able to produce sharp images of objects at different distances.

Describe and explain how it does this.

.....

13 marks

14. a) A student hung a magnet next to coil of wire to make a door chime as shown in **Fig.9**.

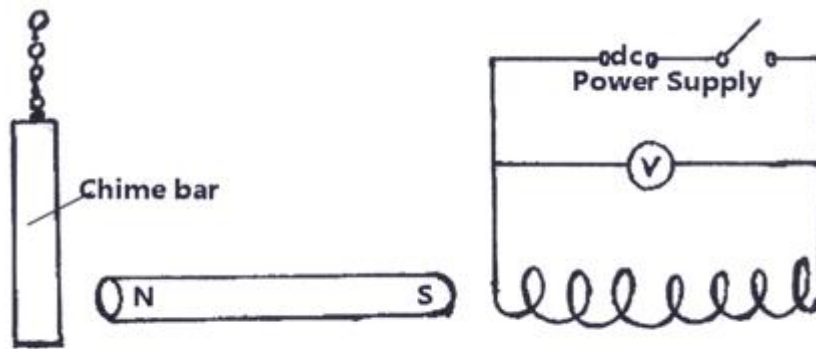


Figure 9

When the current was switched on the magnet hit the chime bar which made a noise.

(i) Explain how the current made the magnet move towards the chime bar.

.....

(ii) The student wanted the magnet to hit the chime bar harder, suggest two changes that would it happen to the energy as the current flows through the coil.

.....

(iii) The student was told to describe the energy transfers inside the device. Give two changes that will happen to the energy as the current flows through the coil.

.....

.....

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b) A coil of wire is connected in series with a battery a rheostat and a switch as shown in **Fig.10**

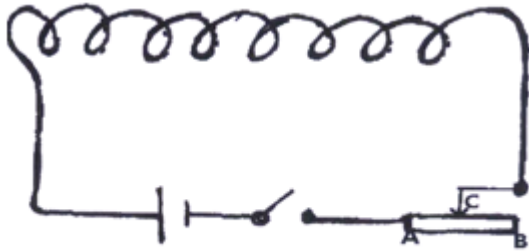


Figure 10

(i) Draw, on the diagram, the shape of the magnetic field inside and outside the coil when the switch is closed.

If the slider C on the rheostat is moved towards B, what is the effect on?

(ii) The resistance of the circuit.

.....

(iii) The current through the coil.

.....

(iv) The magnetic field in the coil.

.....

c) Explain why a transformer will only transform alternating voltages not d.c voltages.

.....

.....

.....

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.....

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13 marks

15. a) A car battery is used to light a 12V lamp A constant current of 3A passes round the circuit.

(i) Explain what happens to the energy of the electron as they flow through the lamp wire.

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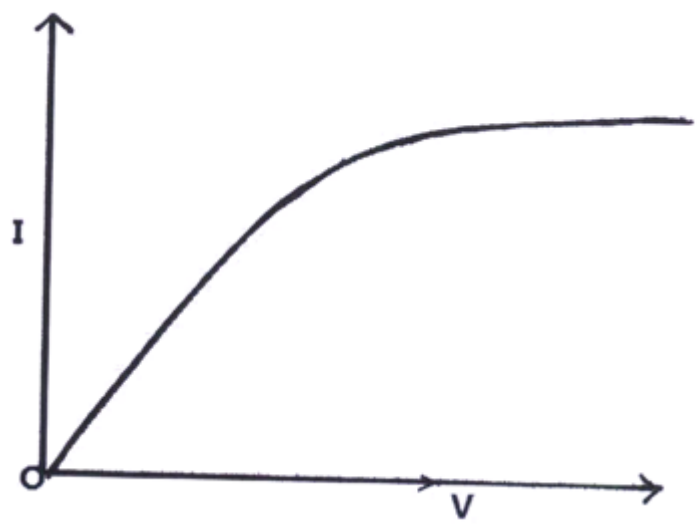
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(ii) How much energy is transferred by the lamp in 20 seconds?

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.....
.....
b) For a particular specimen of wire, a series of readings of the current through the wire for different potential differences across it is taken and plotted as shown.



(i) Explain how the resistance of the wire changes.

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.....
.....
.....
.....

(ii) How would the resistance of a piece of wire change if
I. The length were doubled

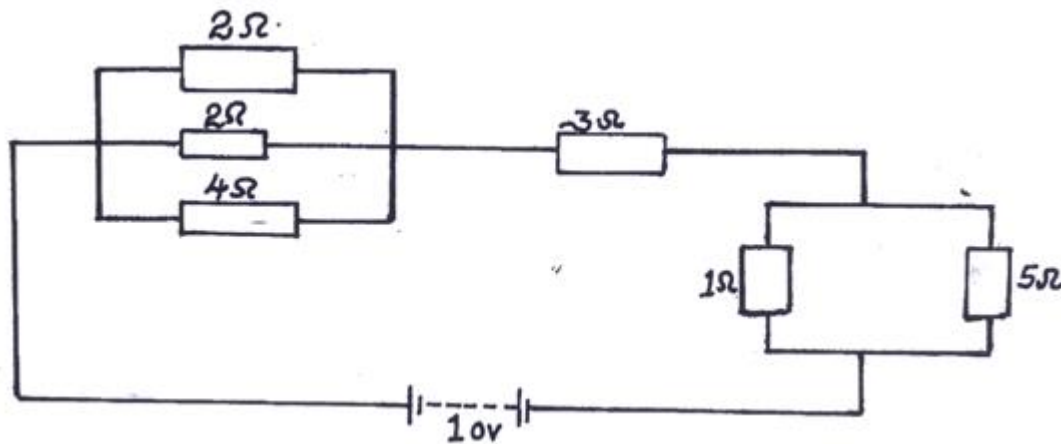
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II. The diameter was doubled.

.....
.....
.....

10 marks

16. a) Use the circuit in figure below to answer the questions that follow.



i) Calculate the total resistance in the circuit.

.....

ii) Determine the current flowing through the 5Ω resistor.

.....

A current flows through a coil wire of resistance 50Ω when it is connected to the terminals of battery. If the potential difference is 20v .

find:

i) The value of current

.....

ii) The number of electrons that pass through the coil per second. (Take charge of electrons $e = 1.6 \times 10^{-19}\text{C}$)

.....

10 marks

17. a) State the motor rule.

.....

b) Sketch the resultant field pattern around the following current carrying conductors and show the direction of the forces acting on the conductors.



c) **Figure 11** shows an electric bell.
Push button switch

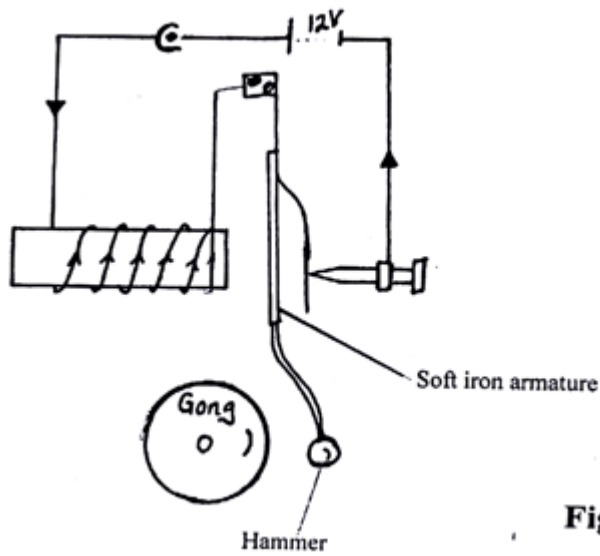


Figure 11

i) Describe how the electric bell works. (3marks)

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ii) Explain what would happen if the armature is made of steel. (1mark)

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iii) What adjustments should be done to the system to make it operate effectively with a lower voltage battery?

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9 marks