

NAME: _____ ADM NO: _____ CLASS: _____
 CANDIDATE'S SIGNATURE: _____ DATE: _____

PHYSICS PAPER 2
FORM THREE
END TERM 3 2024
TIME: 2 HOURS

Instructions to candidates

This paper consists of two sections **A** and **B**.

Answer **all** the questions in the two sections in the spaces provided after each question

All working **must** be clearly shown.

Electronic calculators, mathematical tables may be used.

For Examiner use only

SECTION A 25 MARKS

Define the term
refraction

(1mk)

a) Define local
action

(1mk)

SECTION	QUESTION	MAX MARKS	CANDIDATE'S SCORE
A	1 – 8	25	
B	9	13	
	10	15	
	11	15	
	12	12	
	TOTAL	80	

b) A charge of 4.8C flows through a lamp for ten minutes. Calculate :

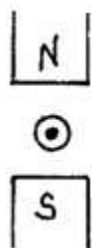
(i) Current

(2mks)

(ii) Number of electrons involved per second.

(2mks)

3. (a) The figure below shows a current carrying conductor placed perpendicularly between the poles of a magnet. Show on the diagram the direction of net force on the conductor. (1 mark)



- b) Using domain theory, describe how a nail can be magnetized through hammering. (2 marks)
- c) A mine worker stands between two vertical cliffs 500m from the nearest cliff. The cliffs are x metres apart. Every time he strikes the rocks, he hears the echoes. The first one comes after **2.5s** while the other comes **3s** later. Calculate the distance between the cliffs. (3 mks)

4. An object is placed 30cm in front of a concave mirror of focal length 20cm. Determine

a. Size of the image.

(2mks)

b. Magnification

(2mks)

c) Name one applications of concave mirrors

(1mk)

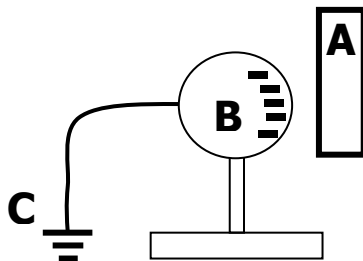
5. **State** the reason why the sound of thunder is always heard sometime after lighting

1mk

6. State two factors that affect the speed of sound in air

(2mks)

7. Figure represents a step in charging a material **B** negatively by induction.



(i) What is the charge on **A**?

(1mk)

(ii) Explain what happens at **C**.

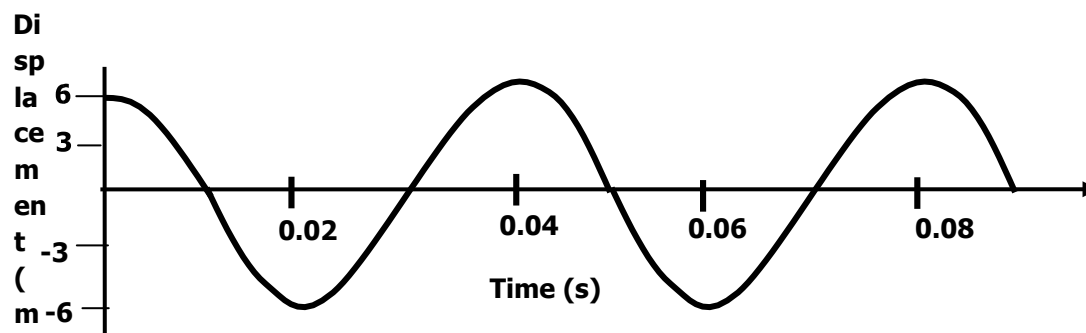
(2mk)

8. Explain what causes electrical resistance in conductors?

2mks

SECTION B 55 MARKS

9. a) The Figure below shows a wave profile of moving at a velocity of **150m/s**.



Determine:

(i) Amplitude (1mk)

(ii) Period. (2mk)

(iii) Frequency. (2mk)

(iv) Wavelength. (2mk)

(V) On the same axis of the wave above, sketch a wave with half the amplitude and double the period. (2mks)

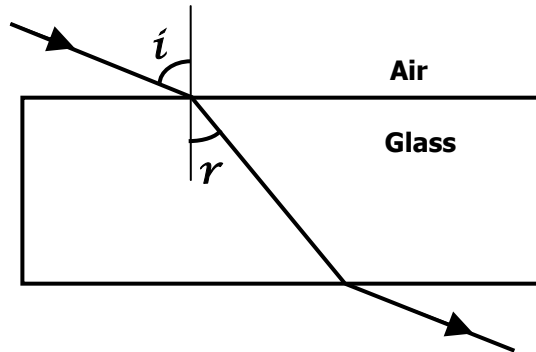
b) State ONE difference between mechanical and electromagnetic waves (1mk)

c) Define the term progressive waves (1mk)

d) Name two types of progressive wave motion 2MKS

10. a) A nail at the bottom of a beaker containing glycerin appears to be 6.8 cm below the surface of glycerin. Determine the height of the glycerin in the beaker. (take the refractive index of glycerine as 1.47) (3mks)

- b) A ray of light makes a glancing angle of incidence $i = 60^\circ$ with a flat glass surface as shown in figure



Given that the critical angle for glass is 42° determine;

- (i) The refractive index of glass (2mks)
- (ii) The angle of refraction r (2mks)
- (iii) Given that the speed of light in air 3.0×10^8 m/s, find the speed of light in glass (2mks)

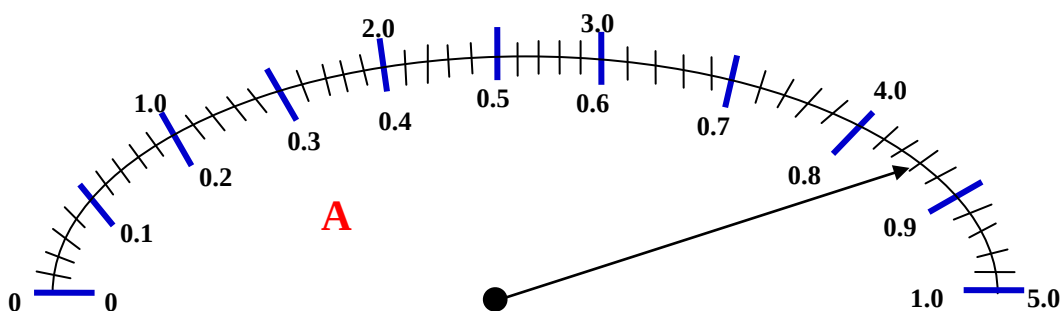
- c) What is an echo?

1mk

- d) A Girl stands some distance from a high wall and claps her hands
 (i) What two measurements would need to be made in order to determine the speed of sound? (2mks)

(ii) **Describe** how you would make use of these measurements 3mks

11. Figure 9.below shows an ammeter used to measure current through the conductor. The student used the lower scale.



a) Make the reading (1mks)

- b) A 24V battery is connected across an 8Ω resistor in series with a parallel combination of a 12Ω resistor and a 6Ω resistor as shown in **figure 17** below

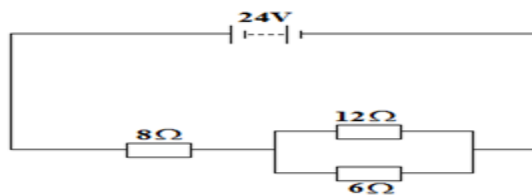


Figure 17

Determine:

- I. The total resistance in the circuit (3 marks)
- II. The current in the circuit (2 marks)
- III. Calculate the voltage drop across an 8 ohm resistors (2mks)
- IV. Current in 6 ohms resistor (2mks)
- c) A cell drives a current of 3.2A through a $2.8\ \Omega$ resistor. When it is connected to $1.6\ \Omega$ resistor, the current that flows is 5A. Find the emf and internal resistance of the cell (4marks)
12. (a) An object of height **10cm** is placed **5cm** in front of convex mirror of focal length **3cm**. determine:
- (i) Position of the image. (2mks)
- (ii) Size of the image. (2mks)

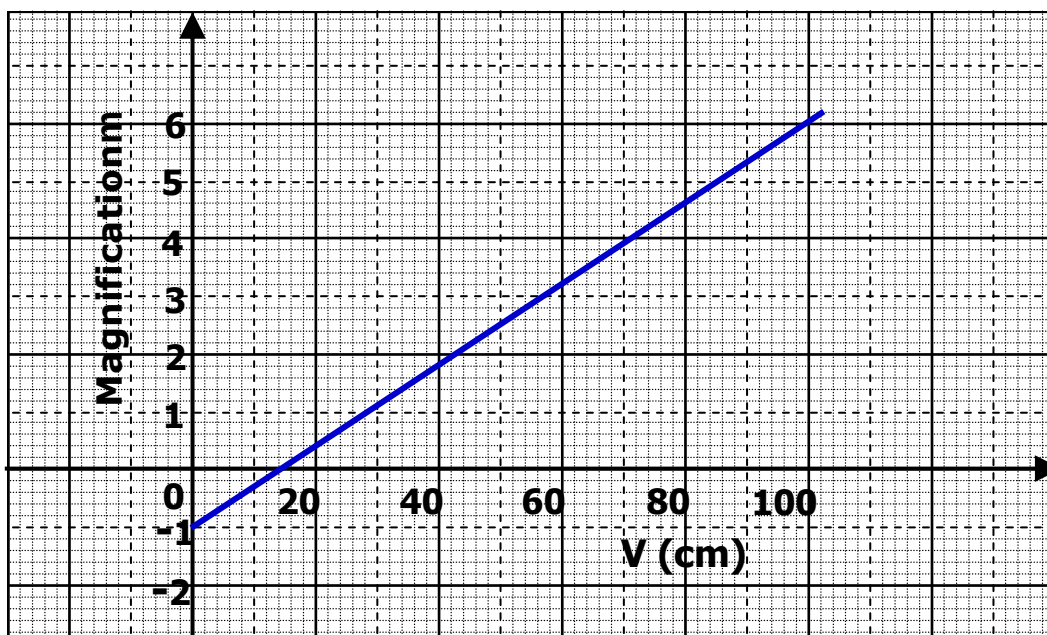
(iii) Nature of the image formed.

(2mks)

b) Show that the linear magnification **M** of a convex mirror is given by

$$M = \frac{V}{f} - 1 \text{ (3mks)}$$

c) The graph below shows the relationship between magnifications of the image against image distance of a concave mirror.



(i) Determine the slope of the graph.

(2mk)

Given that the mirror formula for the graph is $\mathbf{m} = \frac{v}{f} - 1$, Determine the;

(ii) Focal length $\mathbf{f}$ of the mirror. (2mk)