MINISTRY OF EDUCATION
DEPARTMENT OF BASIC EDUCATION

Name:……Adm. No. …… Class …….

232/2 PHYSICS Paper 2
Time: 2 hours

FORM THREE - END OF TERM III 2024

Instructions to Candidates

(a) Write your name and class Admission number in the spaces provided above.
(b) Sign and write the date of examination in the spaces provided above.
(c) This paper consists of **TWO** sections: **A** and **B**.
(d) Answer **ALL** the questions in sections **A** and **B** in the spaces provided.
(e) ALL working **MUST** be clearly shown.
(f) Mathematical tables and nonprogrammable silent electronic calculators may be used.

For Examiner's Use Only

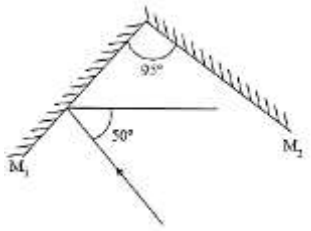
Section	Question	Maximum Score	Candidate's Score
A	1 –12	25	
B	13	12	
	14	14	
	15	9	
	16	12	
	17	8	
Total Score		**80**	

This paper consists of 12 printed pages. Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing

SECTION A– 25 MARKS

1. The figure shows a ray incident on a plane mirror M_1 at an angle of 50°. Mirror M_1 is inclined at an angle of 95° to a second mirror M_2:

(i) Complete the diagram to show how the ray will finally be reflected from mirror M_2 (1mk)



(ii) State the angle of reflection in M_2. (1 mk)

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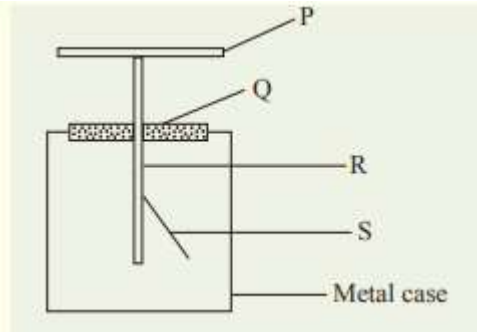
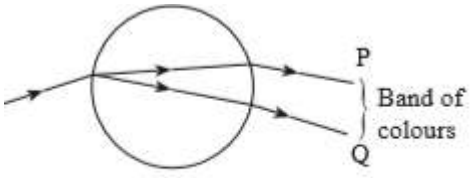
2. The following figure shows the features of a gold-leaf electroscope.



(a) (i) Name the parts P, and S. (1mks)

(ii) Explain the purpose of the metal case. (1mk)

3. The figure below shows the formation of a band of colours when white light traverses a drop of water:



(i) Explain why it is split into different colours between P and Q. (2 marks)

(ii) What natural phenomenon is associated with the above? (1 mark)

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4. A boy standing in front of a high wall claps his hands once and hears an echo after 0.64 seconds. If he moves 20 m farther away from the wall and claps again, he hears the echo after 0.76 seconds. Calculate the speed of sound. (3 marks)

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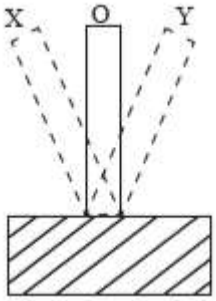
5. The diagram below shows a blade fixed on a wooden base and plucked to vibrate about the rest position.



If the movement from O to X and back to O takes 0.4 seconds, calculate the frequency of vibration of the blade. (2 marks)

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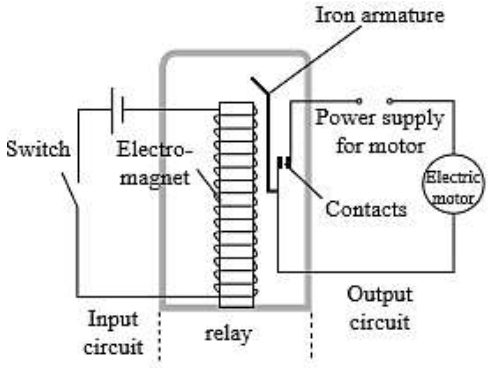
6. The figure below shows an electromagnet relay switch.



Explain its operation. (2 marks)

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7. The diagram below shows a soft iron ring lying next to the south-pole of a magnet.

(a)Draw on the magnetic field patterns between the magnet and the ring. (1mark)

(a) State a practical application of the above effect. (1 mark)

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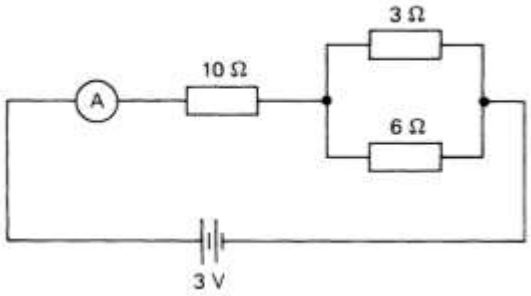
8. The diagram shows an electrical circuit containing a battery of e.m.f. 3 V, an ammeter of negligible internal resistance and three resistors with resistances shown.



What is the reading on the ammeter? (3mks)

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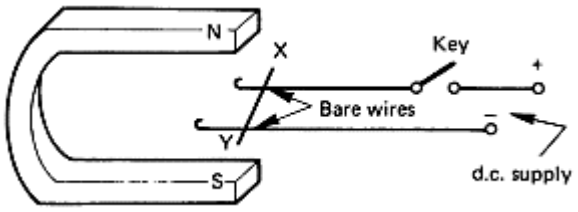
9. State one characteristic of image formed by a pinhole camera which is similar to lens camera (1mk)

10. The diagram shows a U-shaped magnet and an electrical circuit made of a conductor xy.



(i) Explain why the bare wire moves when the key is closed (1mk)

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ii) In which direction will the wire xy move (1 mark)

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11. The image (I) for the convex mirror is always located between F and the pole, it is also diminished. State two more characteristics of the image (I). (2mks)

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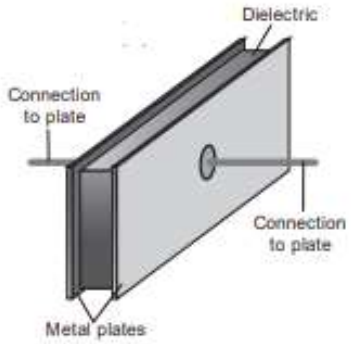
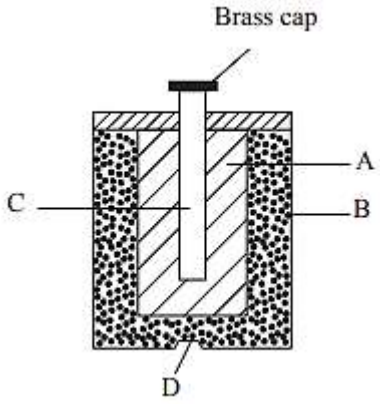
12. The following diagram shows a capacitor.



Explain what is a capacitor (1mk)

SECTION B (55MKS)

13. (a) The figure below shows a dry cell.



(i)Name the parts labelled A, B and C. (3 marks)

(ii) Explain the purpose of parts A, C and D in the cell. (3 marks)

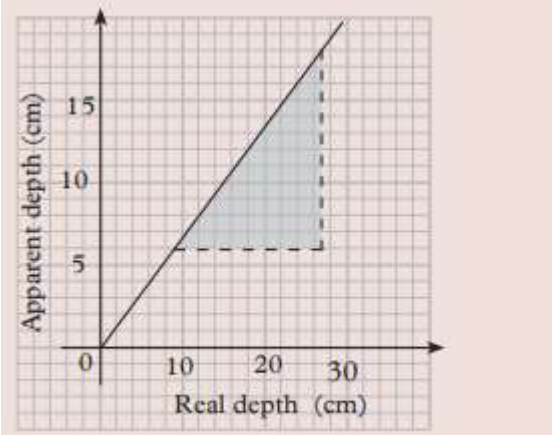
(iii)State the polarity of end marked D. (1 mark)

(iv) Explain why the terminal voltage of the cell is likely to be less than its EMF when in use. (1 mark)

(b) (i) A lead-acid cell is rated 50 Ah and supplies a steady current of 2 A. What does the term '50 Ah' mean? (2 mark)

(ii) State two advantages of lead acid cell over a dry cell. (2 marks)

14. The graph below shows the results obtained when a pin was viewed through different sizes of glass of the same material.



A graph of apparent depth against real depth

(a)Calculate the: (i) gradient of the graph. (2mks)

(ii) refractive index of the glass. (2mks)

(b)i) Define the term critical angle(1mk)

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ii)State two conditions for total internal reflection to occur(2mks)

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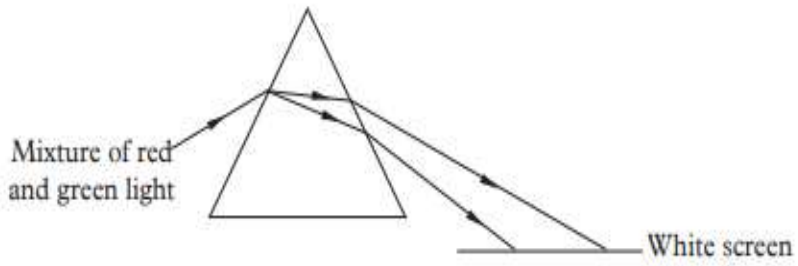
iii)Calculate the critical angle at the water-air interface if the refractive index of water is 1.33(2mks)

(c)A beam of light made of a mixture of red and green light is shone through a prism as shown in the figure below.



(i)What name is given to the 'bending' of light as it enters the glass prism? (1mk)

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ii) Why does light 'bend' as it enters a glass prism? (1mk)

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iii)Why do the two colours of light bend by different amounts inside the prism? (1mk)

(iv)Which colour 'bends' the least? (1mk)

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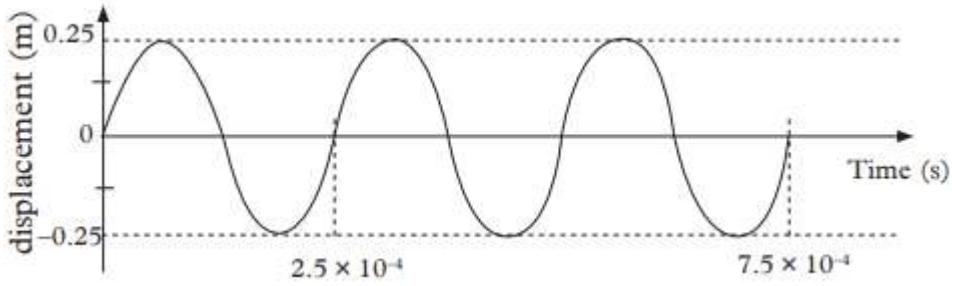
15 a) What is the difference between longitudinal and transverse waves? (2mks

b) The figure below shows a displacement-time graph for a certain wave.



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i) State the Amplitude of the wave (1mk)

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ii) Identify the type of wave. (1mk)

(iii) State the period of the wave (1mk)

(iv) Determine the frequency of the wave. (2mks)

(iv) If the wave has a wavelength of 3.5 cm, what is its velocity? (2mks)

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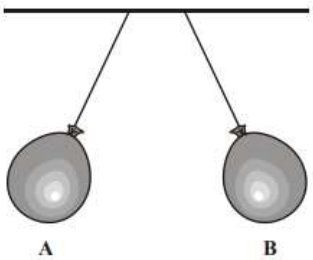
16. The diagram shows two charged balloons hanging from a support on nylon threads.



i) Draw an arrow on each balloon to show the directions of the forces which make the balloons move apart. (1mk)

(ii) Balloon A is positively charged. What is the sign of the charge on balloon B? Explain your answer. (2mks)

(iii) One way of charging a balloon is by rubbing it on a woollen jumper. An aluminum rod held in the hand cannot be charged in this way. Explain why not. (2mks)

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c) (i) State two ways in which static electricity can be put to good use. (2mks)

(ii) State two ways in which static electricity can be harmful or annoying (2mks)

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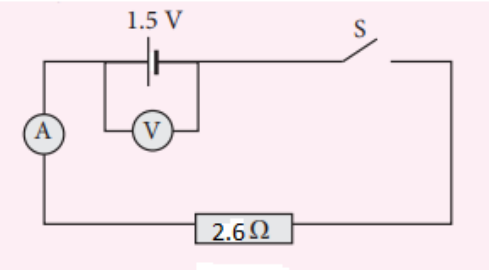
d) state two factors that affects the capacitance of parallel plates capacitor. (2mks)

17. An 'ideal' voltmeter is connected across the terminals of a cell. The voltmeter reads 1.5 V when the switch is open and 1.3 V when the switch is closed.



(a) What is the e.m.f of the cell? (1mk)

(b) What is the terminal voltage of the cell? (1mk)

(c) Calculate: (i) The current in the circuit. (2mks)

(ii) The internal resistance of the cell. (2mks)

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d) Differentiate between Fixed resistors and variable resistors. (1mk)

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e) Give one example of each. (2mks)

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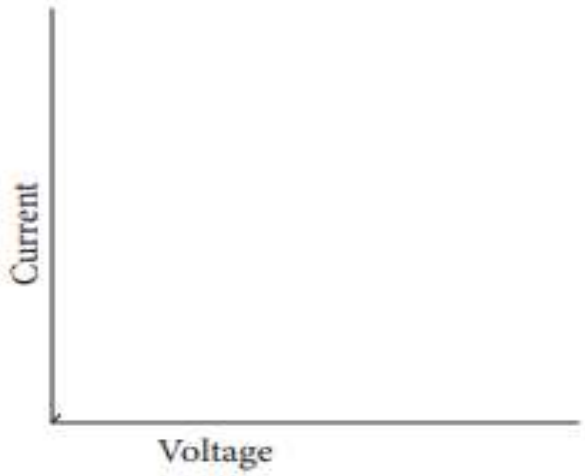
f) Sketch a graph of current against voltage for non- non-ohmic conductor (1mk)



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