

Name: .....Adm. No: .....Class:.....

Candidate's Signature: .....Date: .....

232/2

**PHYSICS**

Paper 2

(THEORY)

Time: 2 Hours

**INSTRUCTIONS TO CANDIDATES:-**

- Write your **name**, **index number** and **class** in the spaces provided above.
- This paper consists of **two** sections; **A** and **B**
- Answer **all** the questions in section **A** and **B** in the spaces provided

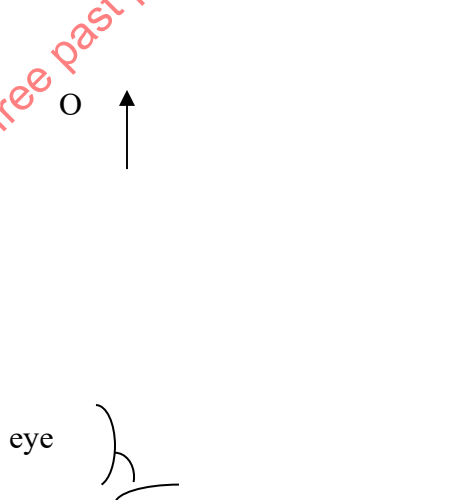
**For Examiner's Use Only:**

Section	Question	Maximum Score	Candidate's Score
A	1 – 15	25	
B	16	15	
	17	13	
	18	15	
	19	12	
Total Score		80	

**SECTION A (25 MARKS)**

1. What property of light is suggested by the formation of shadows? (1 mk)

2. The figure below shows an object O placed in front of a plane mirror.



On the same diagram, sketch rays to show the position of the image as seen by the eye.

3. State two uses of a charged gold leaf electroscope.

(2 mks)

(2 mks)

4. The figure below shows two spherical materials, one an insulator and the other a conductor. Negative charges are introduced at point A in each case.

Insulator

conductor

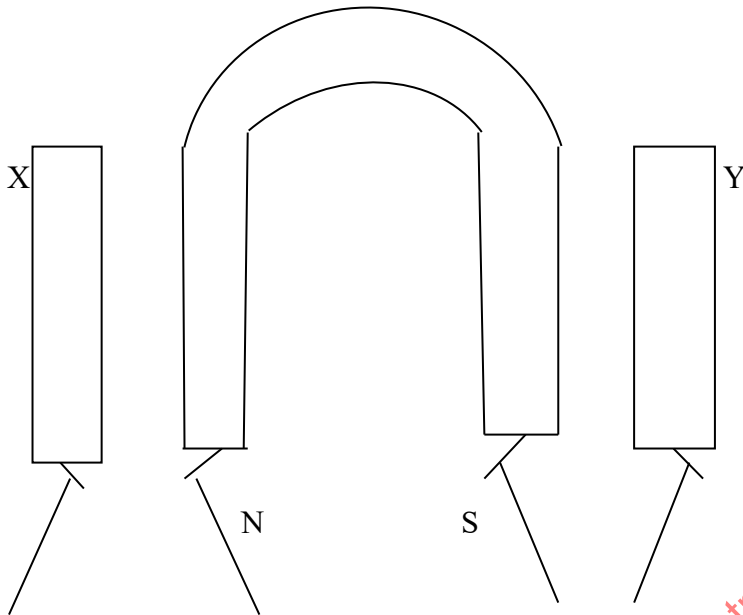
A

A

5. State two advantages of an alkaline battery over a lead acid battery. (2 mks)

6. State the purpose of manganese IV oxide in a dry battery. (1 mk)

7. The figure shows a U- shaped magnet whose poles are labelled and two magnets near it. Iron nails are attracted to the lower ends of the magnets as shown.



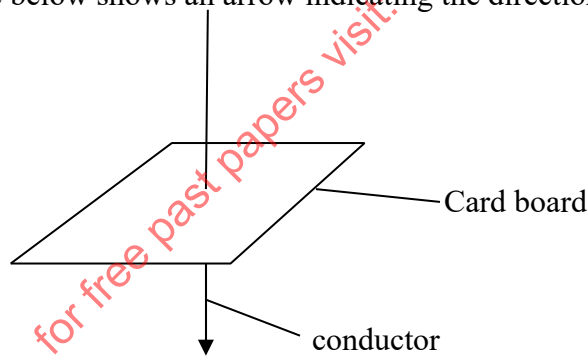
Identify the poles marked X and Y

(2 mks)

X .....

Y .....

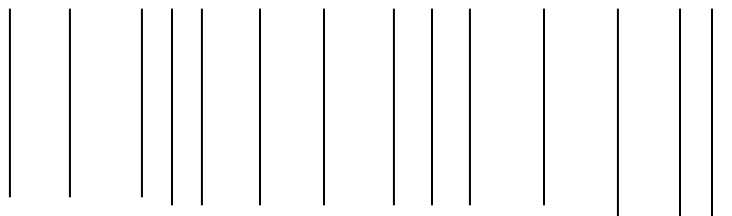
8. The figure below shows an arrow indicating the direction of a current in conductor.



Sketch on the diagram the magnetic field pattern due to the current.

(2 mks)

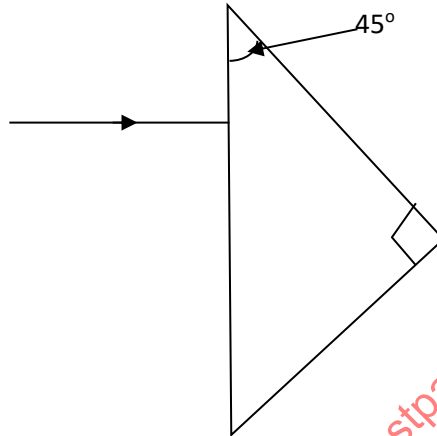
9. The figure below shows a longitudinal wave.



- On the same diagram, indicate the wavelength of the wave. (1 mk)
10. State two factors that affect the speed of sound in air. (2 mks)
11. An observer watching a fireworks display sees the light from an explosion and he hears the sound 2 seconds later. If the speed of sound in air is 330m/s, how far is the explosion from the observer? (2 mks)
12. A wave with a periodic time of 0.2 seconds is travelling at a speed of 50cms<sup>-1</sup>. What is the wavelength of the wave? (3 mks)
13. State one advantage and one disadvantage of a convex mirror when used as a driving mirror. (2 mks)
- Advantage:
- Disadvantage:
14. A girl holds a large concave mirror of focal length 1m, at a distance of 80 cm from her face. State two characteristics of her image in the mirror. (2 mks)
15. State one application of a parabolic mirror. (1 mk)

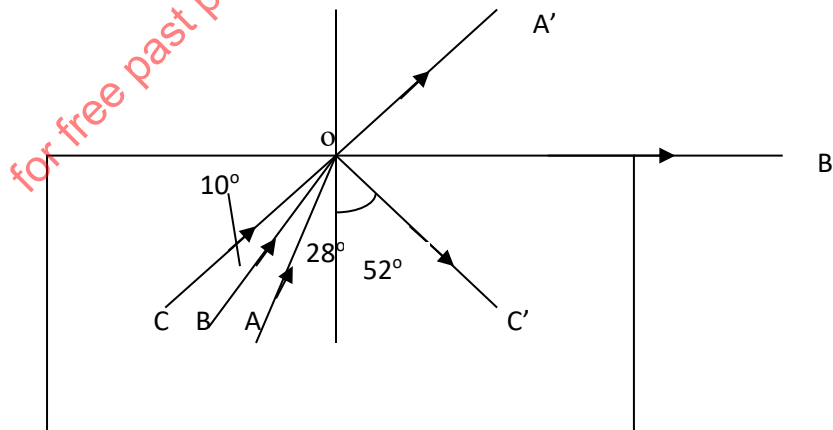
**SECTION B (55MARKS)**

16. a) The diagram below shows a ray of light incident on a glass prism. If the critical angle of the glass is  $42^\circ$ , draw the path of the ray through the prism (2mks)



b) State two conditions necessary for total internal reflection to occur. (2mks)

c) The figure below shows rays of light AO, BO and CO incident on a glass air interface. OA', OB' and OC' are the corresponding emergent rays. Study the diagram and answer the questions that follow.



Determine:

i) The critical angle of the glass. (1mk)

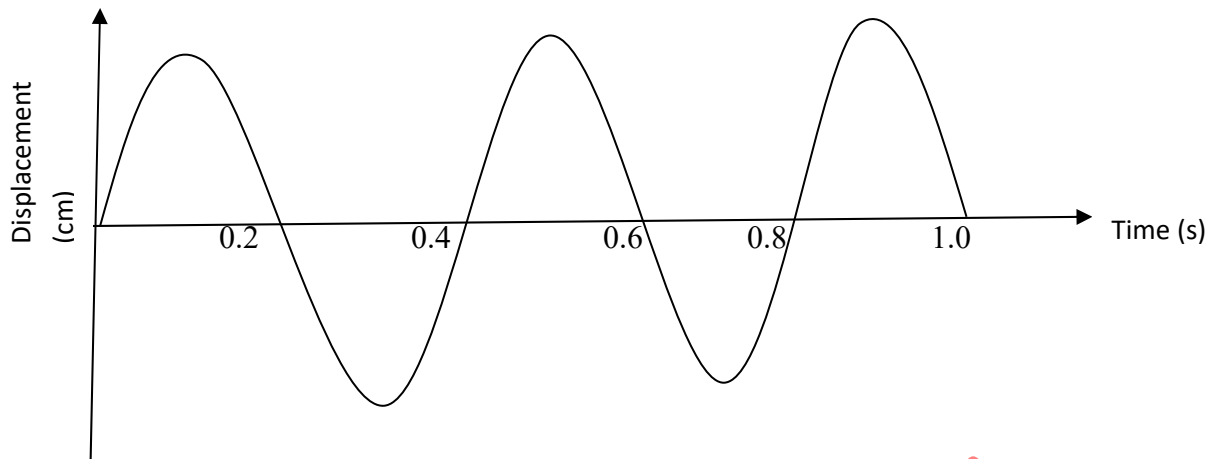
ii) The refractive index of the glass. (3mks)

d) If the speed of light in air is  $3.0 \times 10^8 \text{ms}^{-1}$ , determine the speed of light in water of refractive index 1.33. (3mks)

e) A pin is placed at the bottom of a beaker of depth 11.5cm. The beaker is then filled with paraffin. By using another pin on the side of the beaker and observing from the top, the distance of the image of the pin in the beaker is found to be 3.5cm from the bottom. Determine the refractive index of paraffin. (4mks)

17. a) Distinguish between longitudinal and transverse waves. (2mks)

- b) The figure below shows a displacement-time graph for a progressive wave travelling at  $200\text{cm s}^{-1}$



Determine:

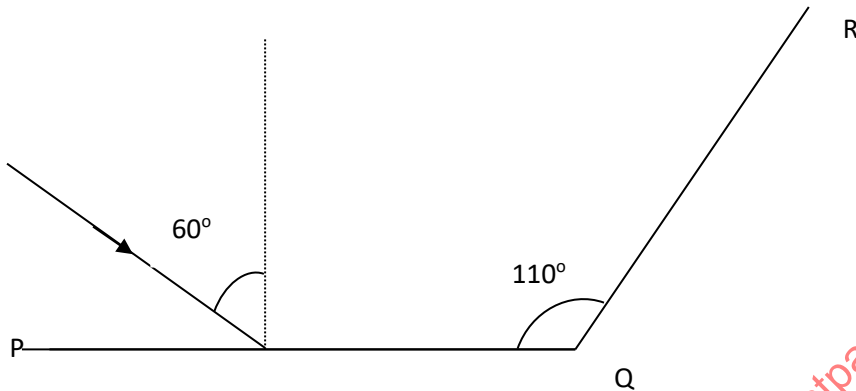
- i) The periodic time. (1mk)
- ii) The frequency of the wave. (2mks)
- iii) The wavelength of the wave. (3mks)

- c) Two vertical cliffs are  $x$  distance apart. A mine-worker stands between the two vertical cliffs, 400m from the nearest cliff. Every time he strikes the rock once, he hears two echoes; the first one after 2.5 seconds, while the second follows 2 seconds later. From this information, calculate:

i) The speed of sound in the mine. (2mks)

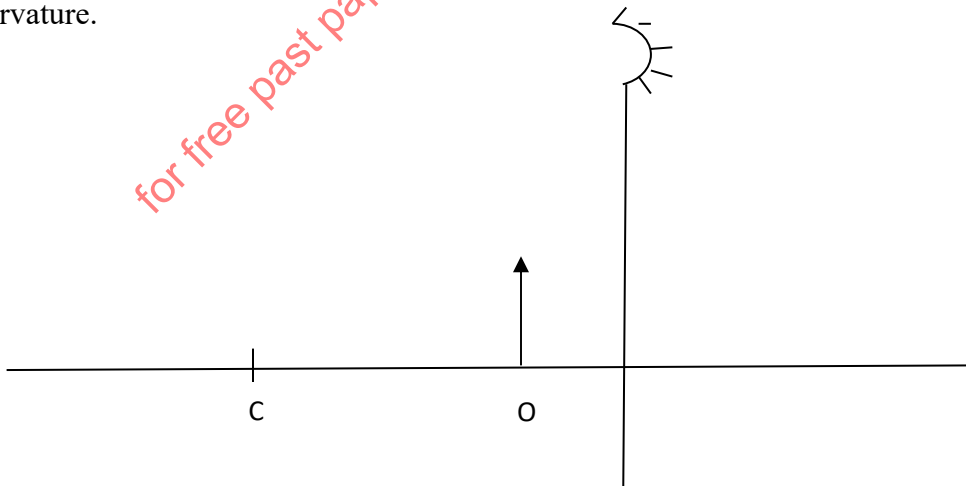
ii) The value of  $x$ . (3mks)

18. a) The figure below shows two mirrors PQ and PR inclined at an angle of  $110^\circ$ . A ray of light is incident on mirror PQ at an angle of  $60^\circ$ . Complete the ray diagram to determine the angle of reflection of the ray in the mirror QR. Indicate the angles at each reflection. (3mks)



- b) Two plane mirrors are inclined at an angle P and forms 5 images. Determine angle P. (3mks)

- c) An object is placed in front of a concave mirror as shown below. C is the centre of curvature.



- i) On the same diagram, use rays to locate the position of the image. (3mks)  
 ii) Determine the magnification of the image. (3mks)



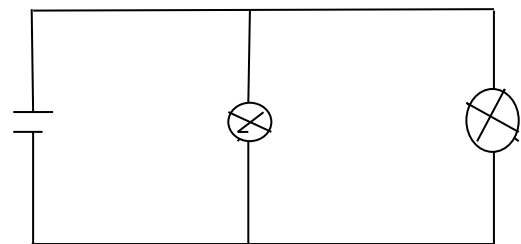
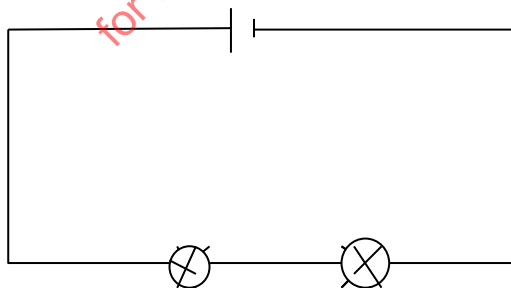
- d) A building standing 200m from a pinhole camera produces on the screen of the camera an image 2.5cm high, 5.0cm behind the pinhole. Determine the actual height of the building . (3mks)

19. a) A current of 0.5A flows in a circuit. Determine the quantity of charge that crosses a point in 4 minutes . (3mks)

- b) i) What is polarization in a simple cell? (1mk)

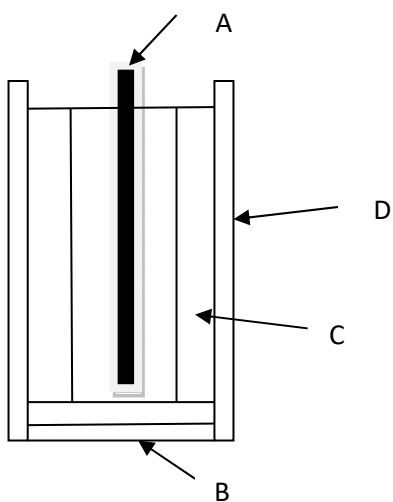
- ii) How is the defect in b(i) above minimized? (1mk)

- c) In the circuit diagrams shown below, the cells and bulbs are identical



- Explain with a reason which of the bulbs in circuit (a) or (b) is brighter. (2mks)

d) The figure below shows the features of a dry leclanche cell.



i) State the polarities of the parts labelled A and B . (2mks)

A.....

B.....

ii) Name the chemical substances in parts labelled C and D. (2mks)

C.....

D.....

e) State a reason why the caps of the cells of a lead-acid battery are opened when charging the battery. (1mk)

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