

Name: ..... Adm. No. ....CLASSS.....

**FORM 4**

**PHYSICS**

**APRIL 2026 HOLIDAY ASSIGNMENT**

**INSTRUCTIONS TO THE CANDIDATES:**

- (a) Write your **name** and **admission number**, **date** and **sign** in the spaces provided.
- (b) Answer **ALL** the questions in section **A** and **B** in the spaces provided.
- (c) All working **must** be clearly shown in the spaces provided.
- (d) Non programmable silent electronic calculator and KNEC mathematical tables may be used.

**For Examiners' Use Only**

<b>SECTION</b>	<b>QUESTION</b>	<b>MAXIMUM SCORE</b>	<b>CANDIDATE'S SCORE</b>
<b>A</b>	1-11	25	
<b>B</b>	12	13	
	13	14	
	14	11	
	15	0	
	16	13	
	18	09	
	<b>TOTAL SCORE</b>	<b>80</b>	

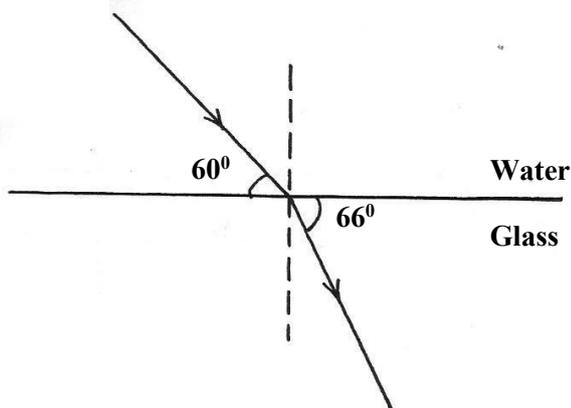
**SECTION A (25MARKS)**

***Answer all questions in this section.***

1. Convex mirrors are used in cars as driving mirrors because they have a wide field of view. Sketch a labelled diagram to show the wide field view (2mks)

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2. The figure below shows a ray of light travelling through water and glass. The refractive index of water is 1.33



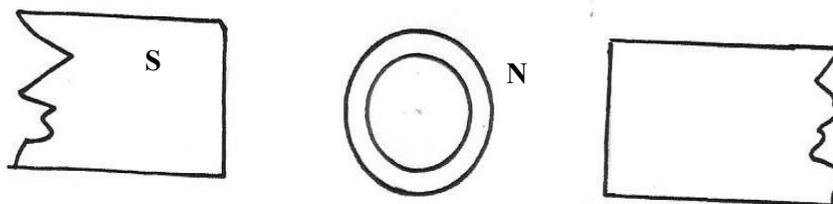
Determine the refractive index of glass (3mks)

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3. A girl standing 600m away from a cliff bangs two pieces of wood together and hears an echo 3.5seconds later. Determine the speed of sound in air at that place. (3mks)

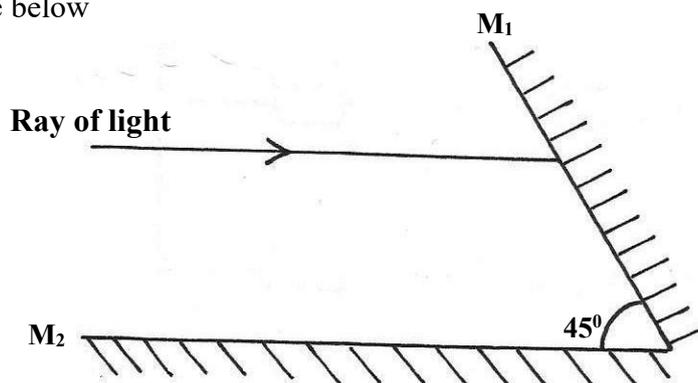
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4. Figure below shows a soft iron ring placed between two magnetic bars



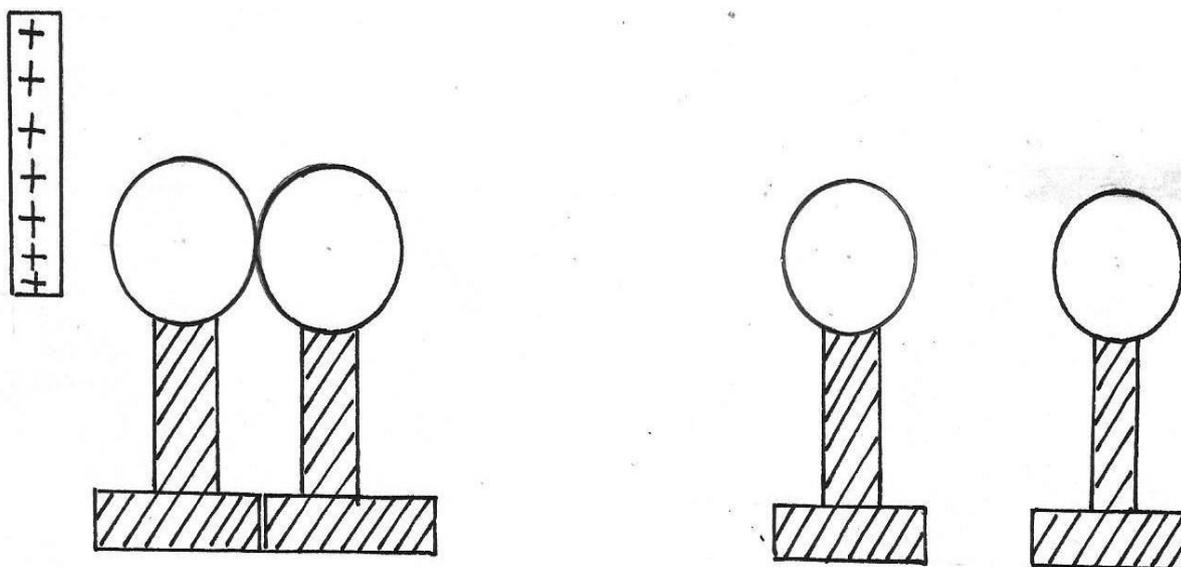
State **one** application where the principle above can be used. (1mk)

5. Two plane mirrors  $M_1$  and  $M_2$  are inclined to each other and a ray of light is shone on  $M_1$  as shown in the figure below



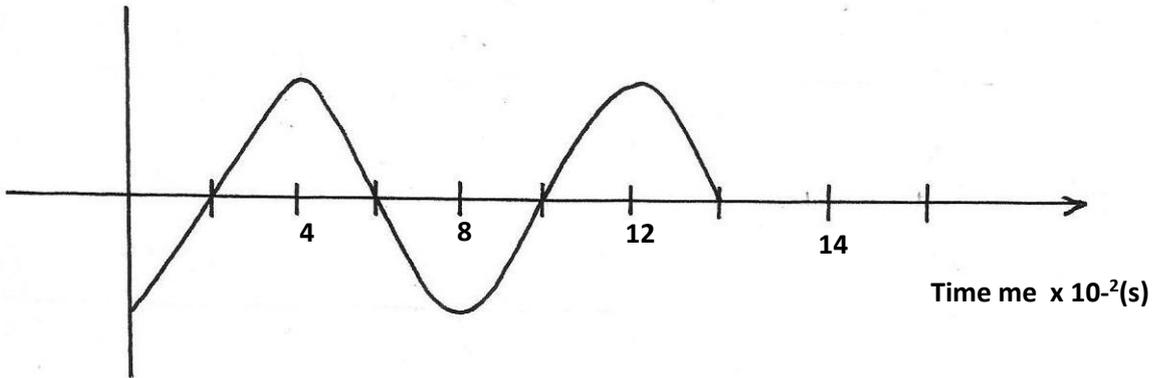
Show on the diagram the path followed by the ray until it is reflected by  $M_2$  (2mks)

6. Two metallic spheres A and B stand in contact as shown. A positively charged rod is held near sphere A. Show the charges on each sphere when the metallic balls are separated and the rod is



removed

7. The wave shown in the diagram below has a velocity of 125m/s



Determine the wavelength of the wave

(3mks)

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8. State two factors to consider for recharging an accumulator

(2mks)

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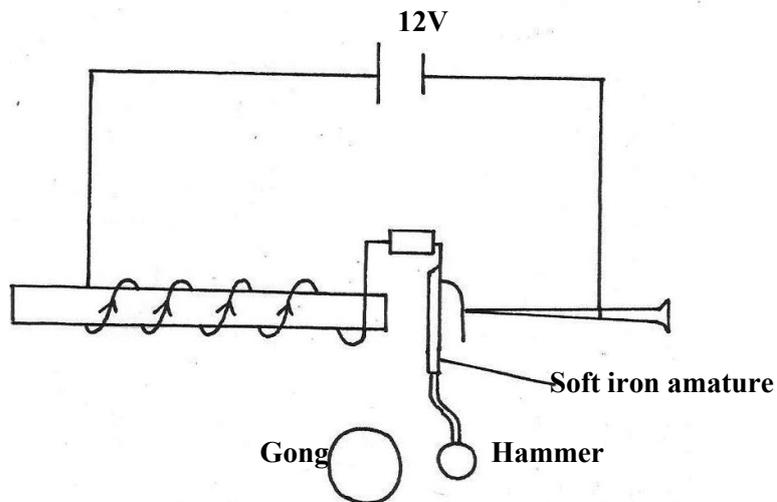
9. Differentiate between electromotive force and potential difference

(2mks)

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10. The figure below shows an electric bell



(a) Describe how the bell works

(3mks)

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(b) What adjustment should be done to the system to make it operate effectively with lower voltage battery? (1mk)

11. State the advantage of the lead acid accumulator over a lenchlanche cell (1mk)

**SECTION B(55MARKS)**

**Answer all questions in this section**

12. (a) (i) State the law of magnetism (1mk)

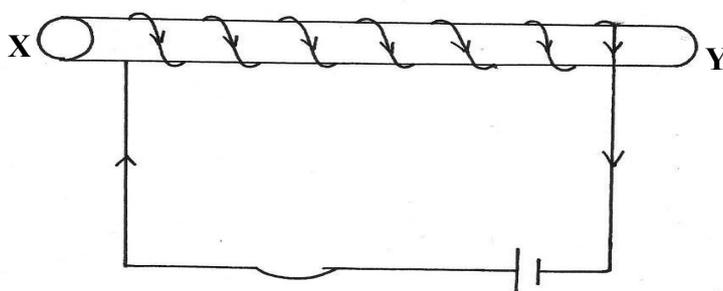
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(ii) Repulsion is the surest test for polarity of a magnet. Explain (2mks)

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(iii) State the difference between magnetic properties of steel and soft iron (1mk)

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(iv) A steel bar was being magnetized by electrical method. It was noted that the strength of the magnet depended on the amount of current. The current was increased steadily until it was noted that the strength of the magnet could not increase further .Explain the observation (2mks)

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(v) State **two** ways of demagnetizing a magnet (2mks)

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(b) Study the figure below and answer the questions that follow



(i) Show, using arrows the direction of the electric current on the solenoid if the switch **S** is closed (1mk)

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(ii) When the switch **S** is closed, the solenoid becomes magnetized. State the magnetic poles at **X**.....  
**Y**.....

(iii) State **two** ways of increasing the strength of the electro magnet (2mks)

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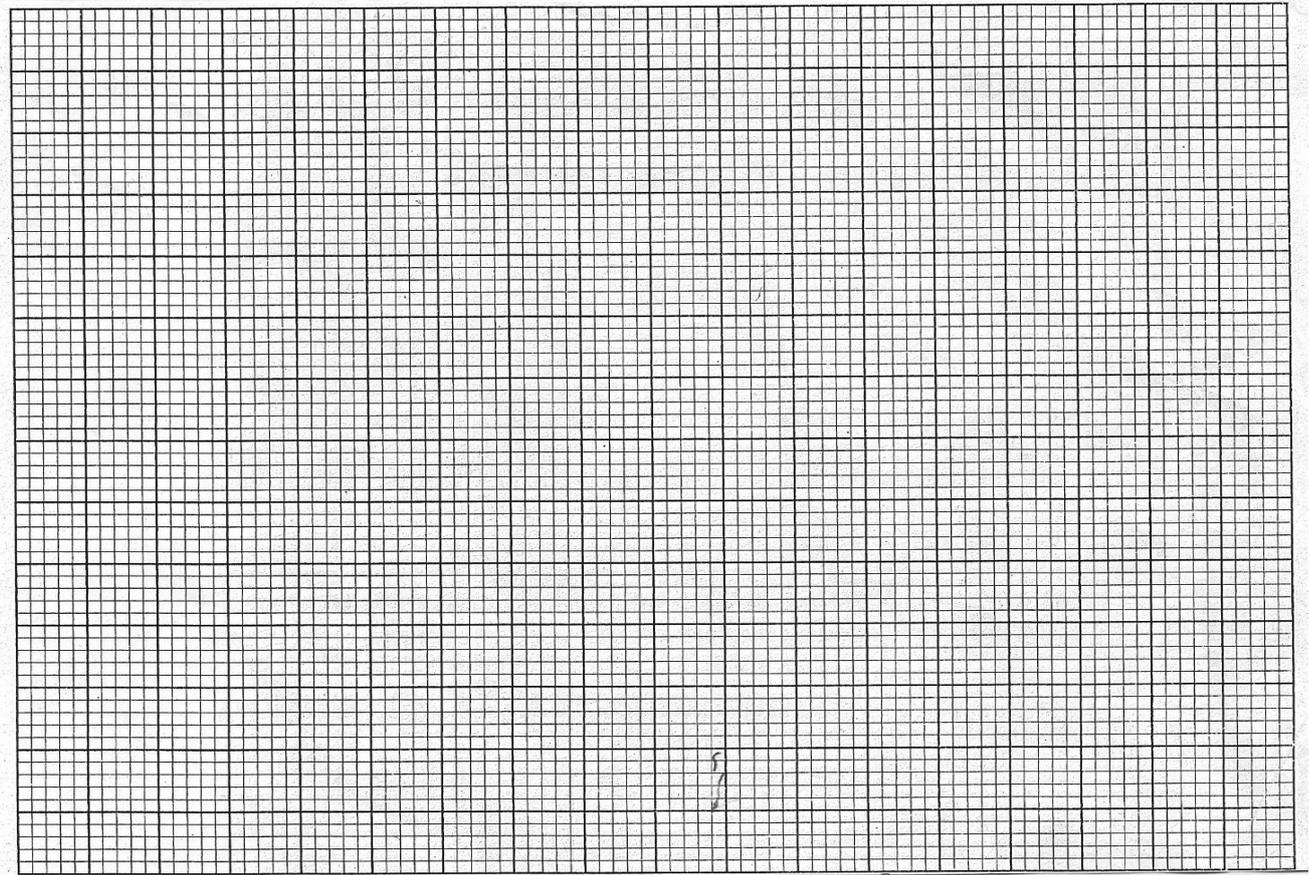
13 (a) State the Ohms law (1mk)

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(b) In an experiment to determine the internal resistance of a cell, the following data was obtained

Voltage (v) $V_x$ $10^{-2}$	14.0	10.0	8.4	6.0	4.2	2.0	1.0
Current (I) $A_x$ $10^{-2}$	1.20	6.00	8.00	10.80	13.00	15.60	16.80

(a) Plot a graph of current(I) against voltage (V) (5mks)



(ii) From the graph, determine

(b) From the graph determine

(i). The internal resistance of the cell

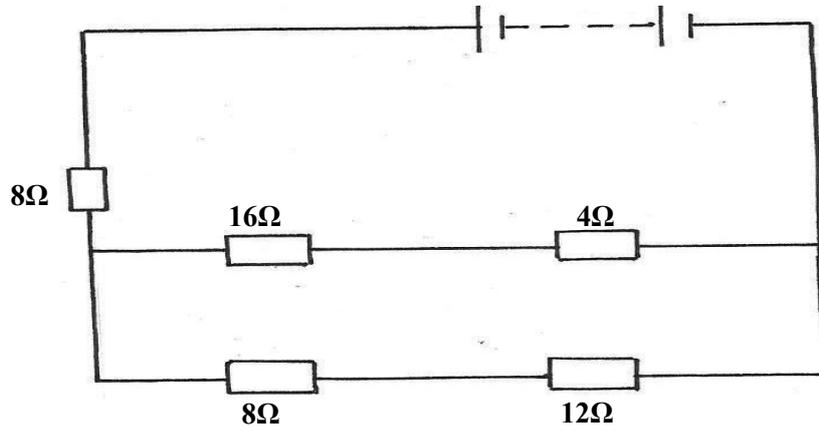
(3mks)

(ii). The e.m.f of the cell

(2mks)

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(c) The figure below shows five resistors connected to a **12V** supply.



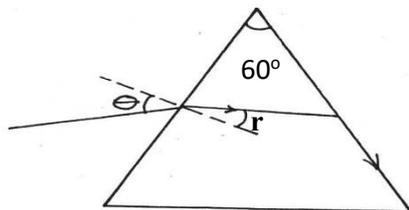
Calculate the effective resistance of the circuit (3mks)

14. (a) State the conditions necessary for total internal reflection to occur. (2mks)

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(b) The figure below shows light being refracted through glass. The velocity of light in a glass is  $1.88 \times 10^8$  m/s

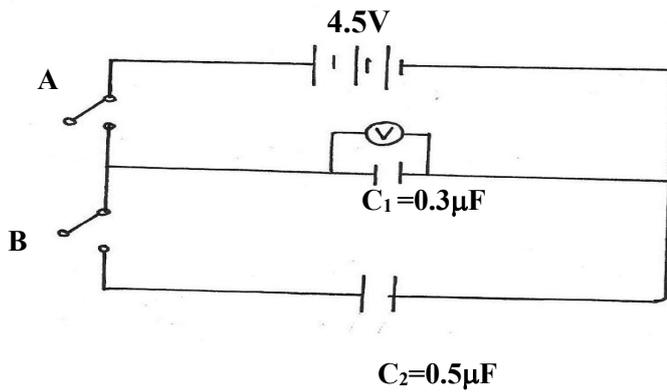


(i) Determine the refractive index of the prism material (speed of light in vacuum,  $C = 3.0 \times 10^8$  m/s) (3mks)

(ii) Show on the same figure above, the critical angle  $C$  and determine its value (3mks)

(iii) Given that  $r = 31.2^\circ$ , Determine the angle  $\theta$  and find its value (3mks)

15. The figure below shows a circuit where battery of 4.5V, switches **A** and **B**, two capacitor  $C_1=0.3\mu\text{F}$  and  $C_2=0.5\mu\text{F}$  and a voltmeter are connected.



- (i) Determine the charge on  $C_1$  when switch **A** is closed and switch **B** is open (3mks)

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- (ii) What is the effective capacitance  $C_T$ , of the circuit (1mk)

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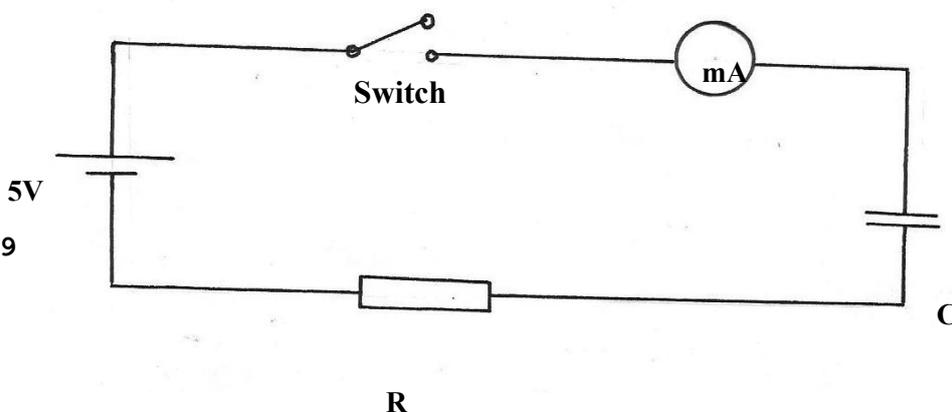
- (b) State what is observed on the voltmeter in the circuit when;

- (i) Switch **A** is closed and switch **B** is open (1mk)

- (ii) Switch **A** is closed and opened and then switch **B** closed (1mk)

- (iii) Explain the observation made in (b)(ii) above (2mks)

- (c) The following figure shows a circuit consisting of a resistor and a capacitor that may be used to charge a capacitor.



(i) State the observation made on the milliammeter when the switch is closed. (1mk)

(ii) Explain the observation made in (c) (i) above. (2mrks)

(d) The circuit in the figure is left on for some time

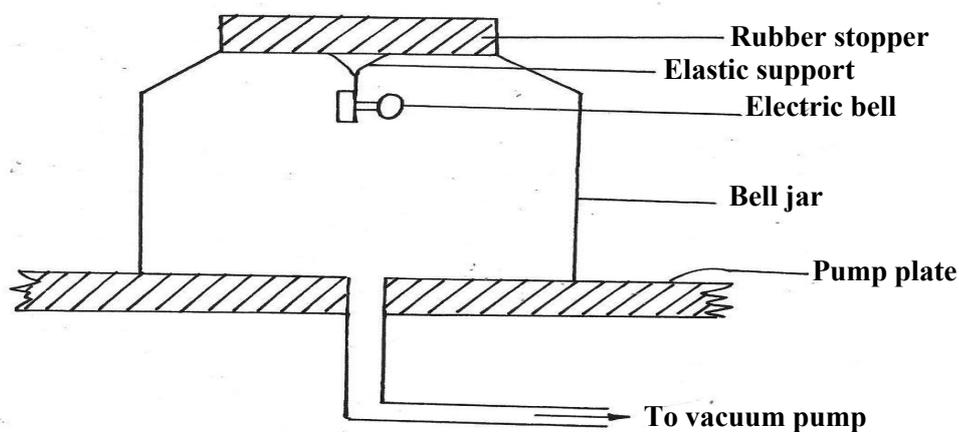
State the value of the p.d across

(i) The resistor **R** (1mk)

(ii) The capacitors **C**

16. (a) State the necessary conditions for interference to occur in waves. (2mks)

(b) The following diagrams shows a set up that was used to demonstrate that sound requires a material medium for transmission.



(i) State what happens to the sound from the electric bell as air continues to be drawn from the bell jar

(1mk)

(ii) What happens to the sound if some air is allowed back in to the jar (1mrk)

(iii) Give possible reason why it is not possible to reduce the sound completely in this experiment (1mk)