

NAME..... INDEX NO.....

232/2  
PHYSICS  
PAPER 2  
(THEORY)  
TIME: 2 HOURS

CANDIDATE'S SIGN.....

DATE.....



# Atika School

Free Online Academy

**INSTRUCTIONS TO CANDIDATES:**

- (a) Write your **Name** and **Index 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 workings must be clearly shown.
- (f) Non-programmable silent electronic calculators and KNEC Mathematical tables **may be** used.

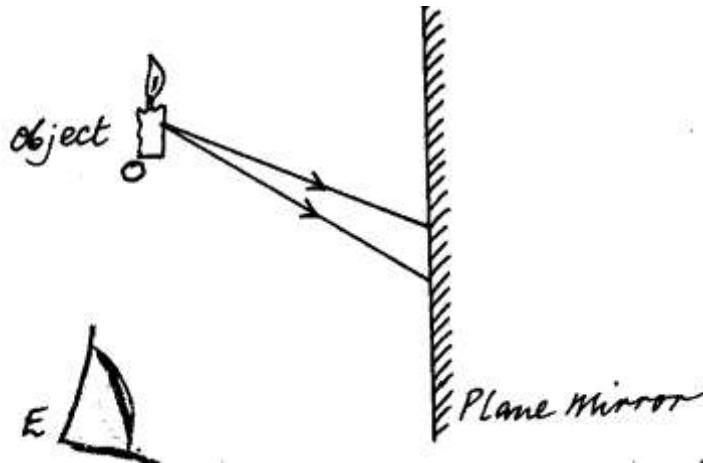
**FOR EXAMINER'S USE ONLY:**

Section	Question	Maximum Score	Candidate's Score
A	1 – 10	25	
B	11	11	
	12	11	
	13	11	
	14	08	
	15	07	
	16	07	
<b>Total Score</b>		<b>80</b>	

**SECTION A: (25 MARKS)**

**Answer all questions in this section in the spaces provided:**

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

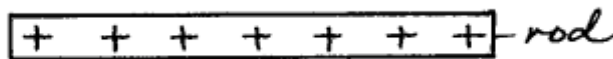


On the same diagram, draw rays to locate the position of the image **I**, as seen from the eye, **E**.

(3mks)

2. The figure **below** shows a negative point charge close to a positively charged rod. Sketch the electric field pattern.

(2mks)



3. Three electric bulbs are connected in series with a battery of two dry cells and a switch.

(a) At first the bulbs light brightly.

State the reason why they gradually light dimly.

(1mk)

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(b) The switch is put off for some time. Explain why the bulbs again shine brightly. (2mks)

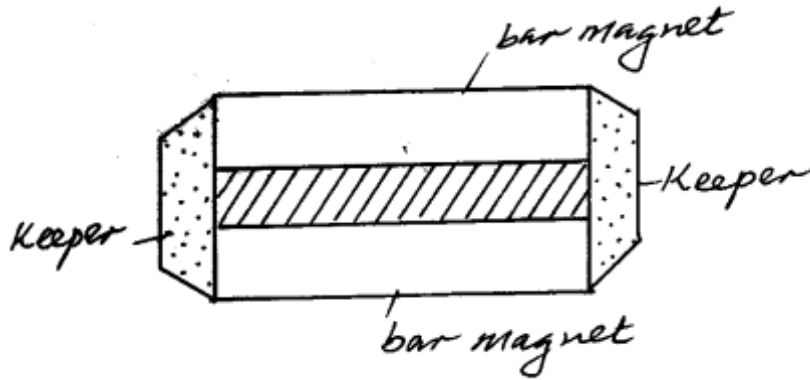
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4. The figure below shows how magnets are stored in pairs with keepers at the ends.



Explain how this method of storing helps in retaining magnetism longer. (2mks)

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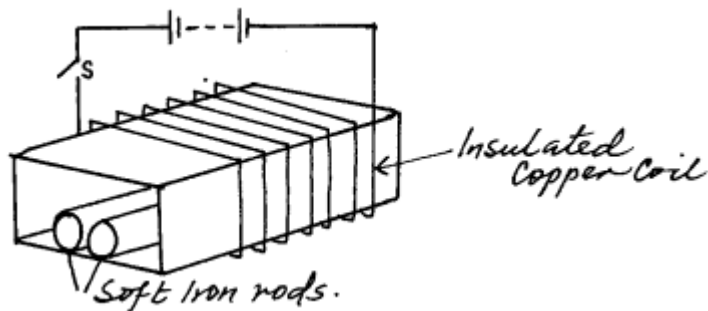


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5. Two soft iron rods are placed inside a coil of wires connected to a battery as shown in the figure below.



State and explain the effect on the rods when the switch is closed. (2mks)

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6. Light of frequency  $5.5 \times 10^{14}$  Hz is made to strike a metal surface whose work function is 2.5 eV. Show that photoelectric effect will not take place. (Planck's constant  $h = 6.63 \times 10^{-34}$  Js, charge on an electron  $e = 1.6 \times 10^{-19}$  C). (3mks)

7. A girl claps his hands once every second and hears the echo from a tall building. When he is 85m away from the building, he hears the echo of each clap mid-way between it and the next clap. Calculate the speed of sound. (2mks)

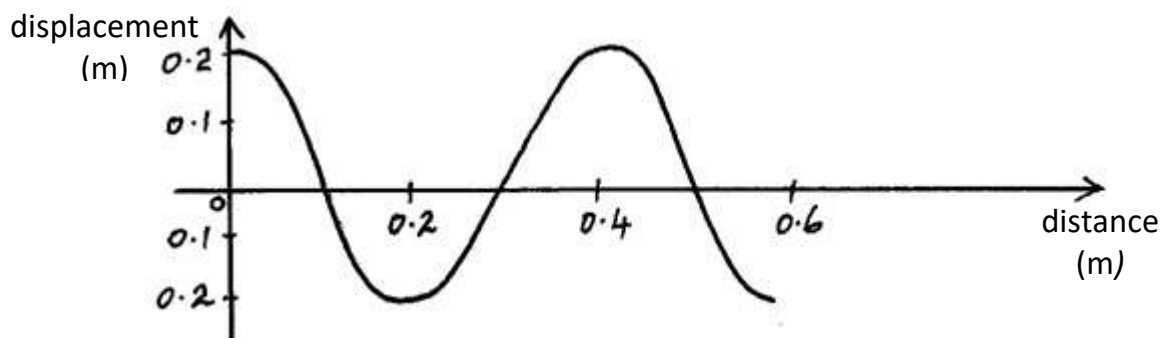
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8. The figure below shows a displacement-distance graph of a wave profile.



- (a) State the amplitude of the wave. (1mk)

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- (b) Given that the period of the wave is 0.25s, determine the velocity of the wave. (2mks)

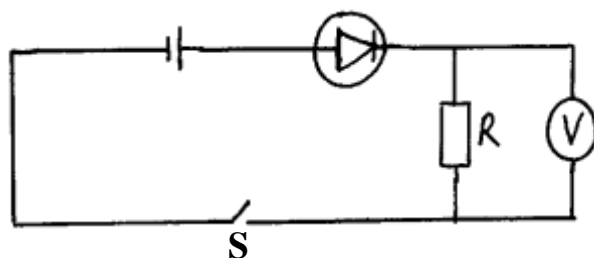
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9. In the figure below, the voltmeter shows a reading when the switch S is closed.



When the cell terminals are reversed and the switch closed, the voltmeter reading is zero.  
Explain these observation. (2mks)

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10. The initial mass of a radioactive element is 80g. The mass remaining after 20 years is 5g.  
Determine the half-life of the substance. (3mks)

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**SECTION B: (55 MARKS)**

**Answer all the questions in this section in the spaces provided.**

11. (a) A lens forms an image four times the size of the object on the screen. The distance between the object and the screen is 60cm when the image is sharply focused.

(i) State with a reason what type of lens was used. (2mks)

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(ii) Determine:

(i) the object distance. (2mks)

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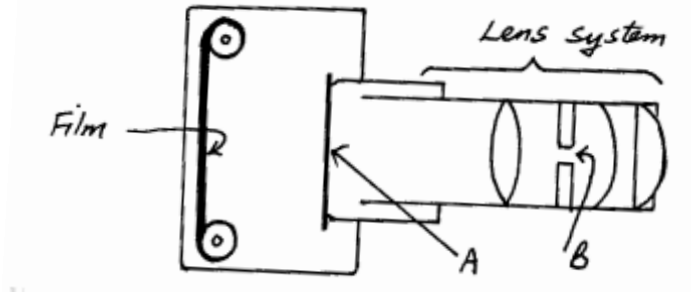
(ii) the image distance. (2mks)

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- (b) The figure below shows the basic parts of a simple lens camera.



- (i) Name the parts labeled **A** and **B**. (2mks)

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- (ii) State the function of each of the parts **A** and **B**. (2mks)

**A** \_\_\_\_\_

**B** \_\_\_\_\_

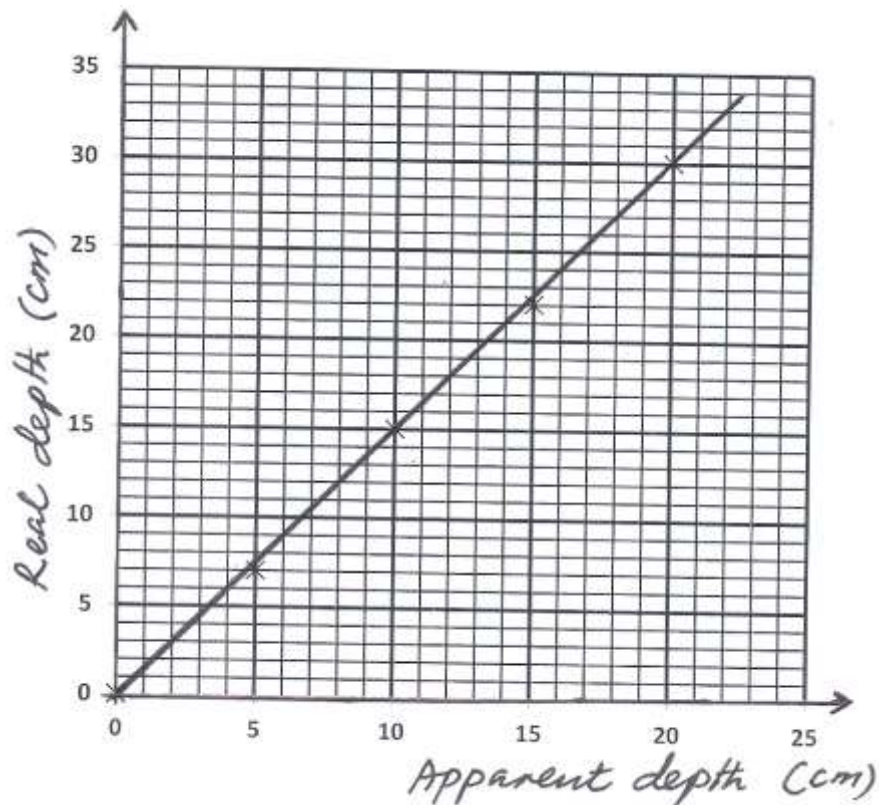
12. (a) State Snell's law of refraction. (1mk)

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- (b) In an experiment to determine the refractive index of a liquid, the liquid was poured into a measuring cylinder, a pin was placed at the bottom of the cylinder and another pin was used to locate the apparent position of the first pin. The values of real and apparent depth were used to plot a graph in the figure below.



(i) From the graph determine the refractive index of the liquid. (3mks)

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(ii) Given that velocity of light in vacuum is  $3.0 \times 10^8$  m/s, what would be the velocity of light in the liquid above? (2mks)

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

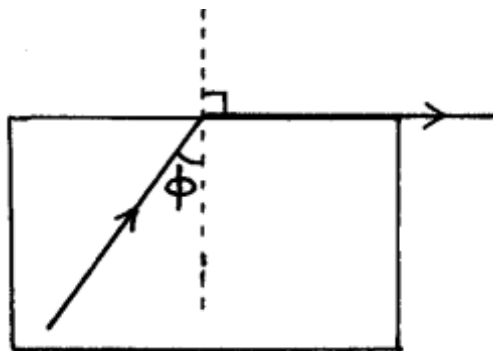
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(d) The figure **below** shows a ray of light incident on a glass-air interface.



Given that the refractive index of glass is 1.48, determine the value of  $\phi$ . (3mks)

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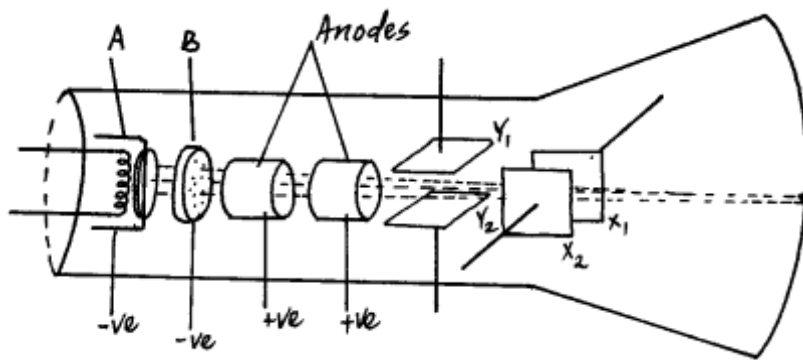
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13. The figure shows the main features of cathode ray oscilloscope (C.R.O).



(a) (i) Name the parts labelled **A** and **B**. (2mks)

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(ii) State the function of **B** and briefly outline how it works. (2mks)

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(iii) State **two** function of the anodes. (2mks)

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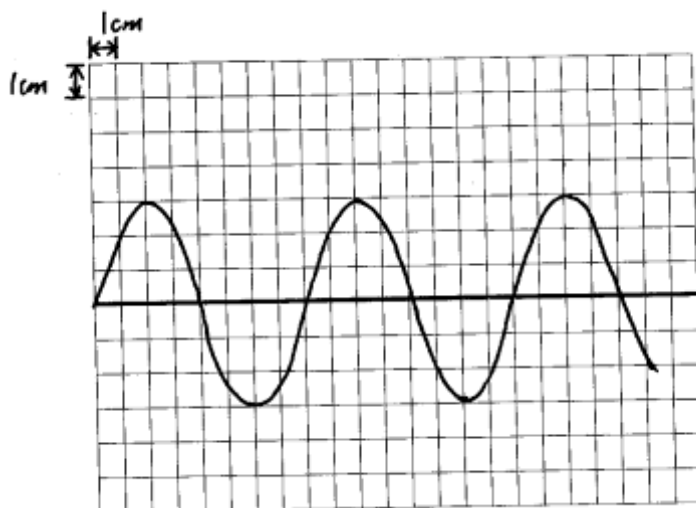


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(b) The output of an a.c generator was connected to the input of the cathode ray oscilloscope whose time base setting was 5 milliseconds per centimeter and the y-gain at 10 volts per centimeter, the figure below shows the waveform displayed on the screen of the C.R.O.





Determine

(i) the peak voltage of the generator.

(2mks)

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(ii) the frequency of the voltage.

(3mks)

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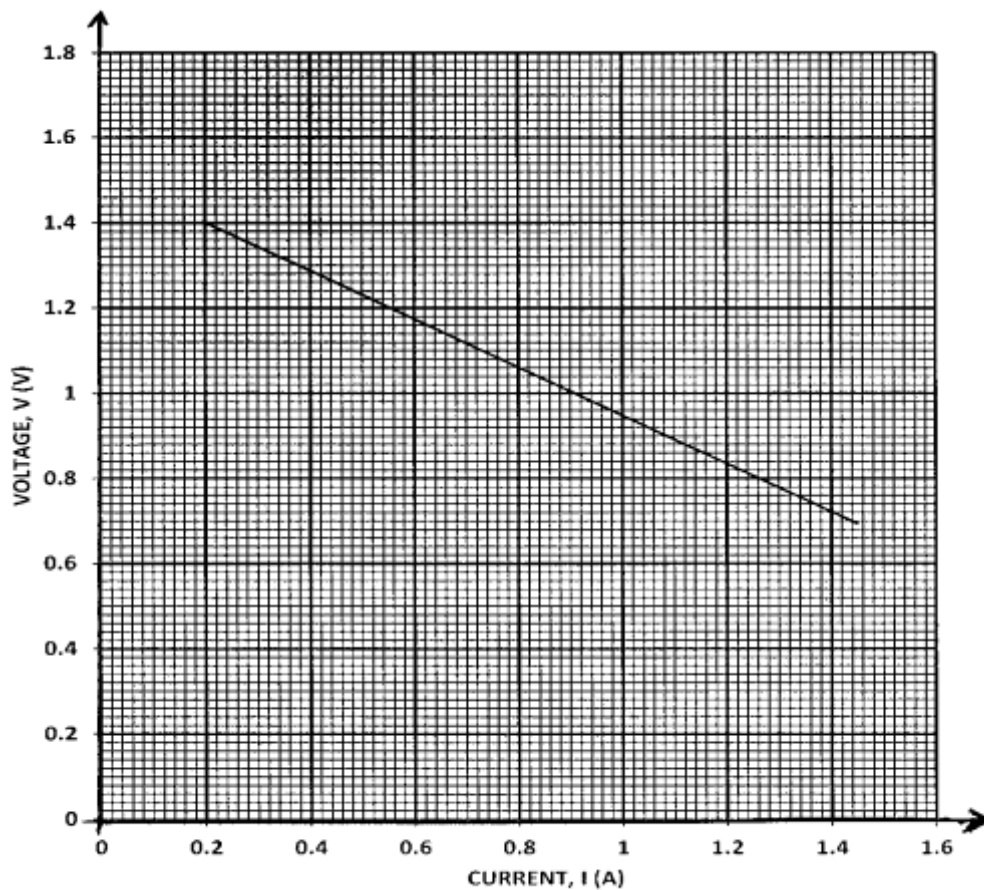
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14. The graph below shows the variation of p.d (V) across the terminals of a cell and the current drawn from the cell.



(a) Use the graph to determine:

(i) the electromotive force (e.m.f)  $\Sigma$  of the cell.

(1mk)

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(ii) the internal resistance  $r$ , of the cell given that  $\Sigma = V + Ir$ . (3mks)

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(b) Draw a circuit diagram that may be used to obtain the values plotted in the graph. (2mks)

(c) Describe briefly how the circuit you have drawn may be used to carry out the experiment to obtain the values in the graph. (2mks)

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15. (a) Explain how a highly negatively charged body with a sharp-pointed edge gets discharged by itself. (2mks)

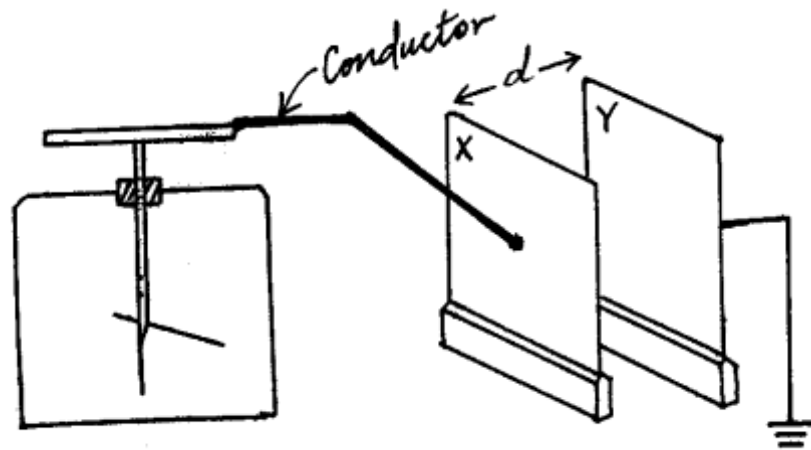
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- (b) Study the set-up of apparatus shown **below**. **X** and **Y** are metal plates each fixed to an insulated stand. **X** is given a charge and **Y** is earthed.



Describe how the set-up may be used to investigate the effect of the following on capacitance  $C$ . State the observation made on the leaf in each case.

- (i) Separation distance  $d$ , between the plates. (2mks)

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- (ii) Effective area between the plates. (3mks)

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16. A transformer has 8000 turns in its primary coil and 200 in its secondary coil. The voltage in the primary coil is 240V.

- (a) Calculate the voltage in the secondary coil. (2mks)

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- (b) If the current in the primary coil is 3A while that in the secondary is 100A, determine the efficiency of the transformer. (3mks)

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- (c) State any **two** reasons why the efficiency of the transformer is less than 100%. (2mks)

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