KAPSABET HIGH SCHOOL

232/2 **- PHYSICS -** **Paper 2**

MOCK 2023

Name …………………..………………………`   **Index No.** ………………..……

Candidates Sign: …….....…..…

Date: …………………………..

232/2

PHYSICS

Paper 2

Time: *2 Hours*

Kenya Certificate of Secondary Education (K.C.S.E)

Instruction to Candidates

(a) *Write your name, 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* *working* **must** *be clearly shown.*
(f) *Silent non-programmable electronic calculators may be used.*
(g) *Candidates should answer the questions in English.*

For Examiners Use Only

Section	Question	Maximum Score	Candidate's Score
A	1 – 12	25	
B	13	12	
	14	12	
	15	12	
	16	9	
	17	10	
Total Score		**80**	

This paper consists of 12 printed pages, candidate should check the questions to ascertain that all pages are printed as indicated and that no questions are missing
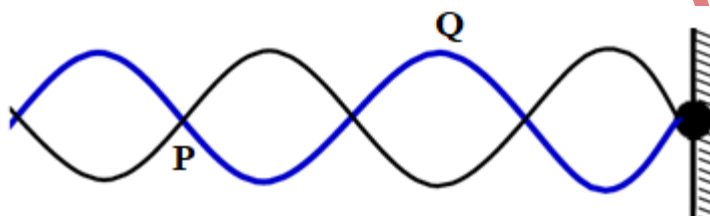
SECTION A 25 MARKS

Answer all the questions in the spaces provided.

1. The figure below shows a ray of light incident on a mirror at an angle of 45°. Another mirror is placed at an angle of 45° to the first one as shown. Sketch the path of the ray until it emerges. (2 marks)
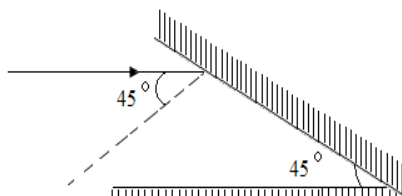
2. The figure below shows a transverse stationary wave along a string.

Name P and Q and explain how each is formed. (3 marks)

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3. The diagrams below show a positively charged acetate strip and a negatively charged polythene strip freely suspended and isolated.
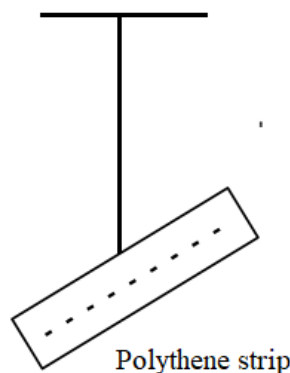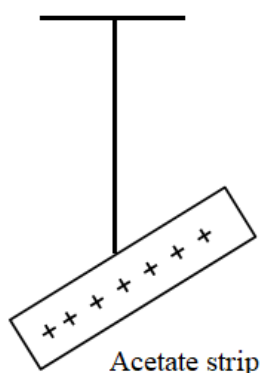
Two rods X and Y are brought up in turn to these strips. X attracts the acetate strip but repels the polythene strip. Rod Y does not repel either the acetate or the polythene. State the type of charge on

each rod.

X .... (1 mark)

Y .... (1 mark)

4. The figure below shows how magnets are stored in pairs with keepers at the end. Explain how this method of storing helps in retaining magnetism longer   (1 mark)
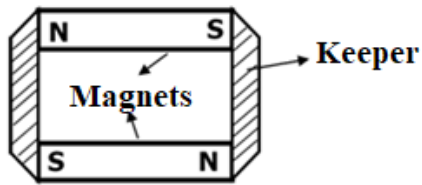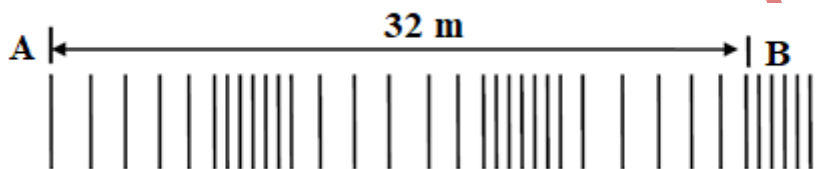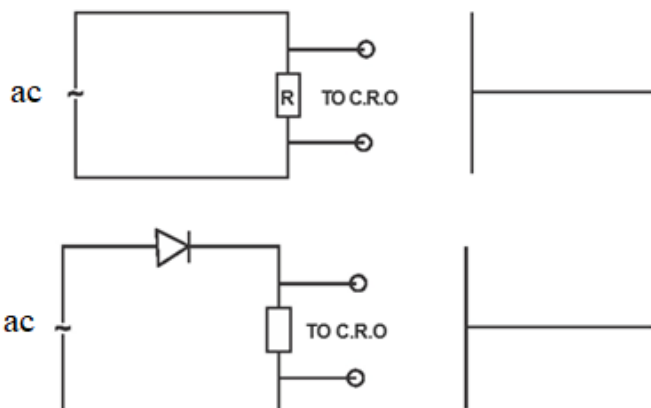

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5. The diagram below shows waves generated from a tuning fork. If the wave takes 0.1 second to move from point A to B. determine the frequency of the wave.   (3 marks)

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6. In the figure 9 and 10 below, sketch a graph for each to show the variation of voltage with time as displayed on a CRO screen.   (2 marks)

7. Other than current state two other factors that affect the magnitude of force on a current carrying conductor placed in a magnetic field.   (2 marks)

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8. Concave mirrors are used by dentists to examine teeth. By use of a ray diagram show how this is achieved. (2 marks)

9. A student connected the set up below in the laboratory. Explain the observation made on the bulb when the set-up below is taken to a dark room (2 marks)

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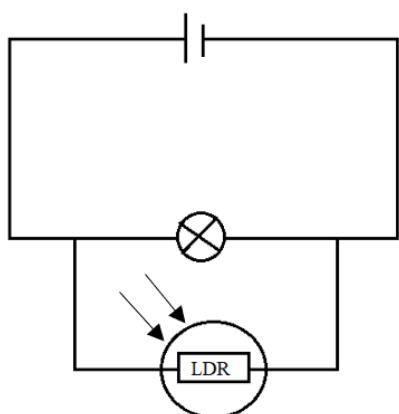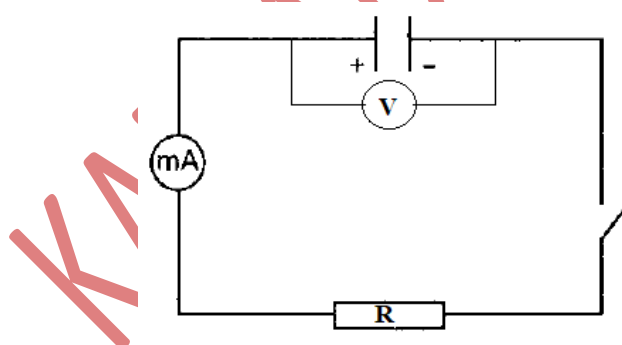
10. The figure below shows a fully charged capacitor

(i) State the observation made on the voltmeter when the switch is closed. (1 mark)

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(ii) State the function of resistor R (1 mark)

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11. Calculate the maximum number of 100W bulbs that can be safely connected to 240V in a circuit fitted with 13A fuse. (2 marks)

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12. The figure below part of electromagnetic spectrum.

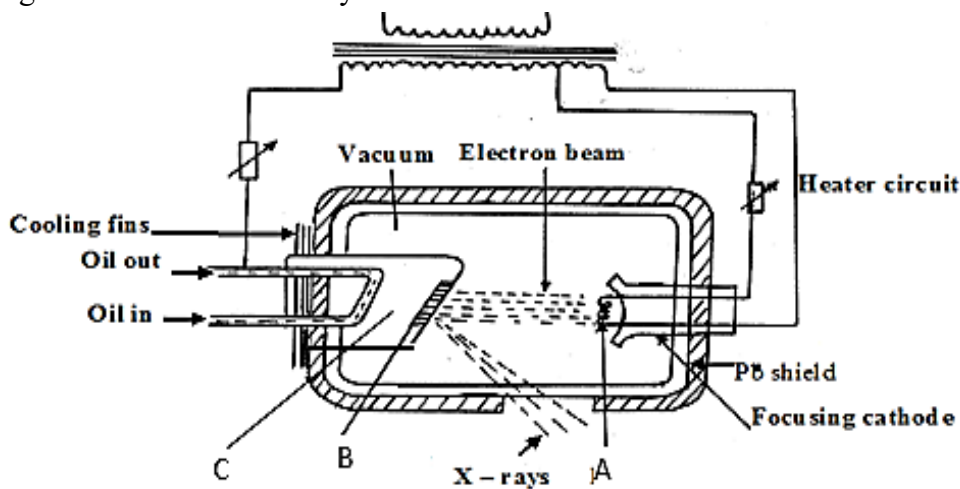| A		Visible light	UV	

Identify radiation A and state its source. (2 marks)

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

13. (a) The figure below shows a X-ray tube.

(i) Name the part labelled C (1 mark)

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(ii) State the property of the material labelled B on the diagram which makes it suitable for use in the X-ray tube. (1 marks)

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(iii) Why is C inclined at an angle of 45°? (1 mark)

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(iv) State the adjustment that can be made to vary

    I. The quality of X-rays (1 mark)

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    II. The quantity of the X-rays. (1 mark)

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(v) An x-ray tube has an accelerating potential of 100KV. Determine the maximum frequency of the x-rays produced.
(Plank's constant = 6.63×10^{-34} Js, e = $1.6 \times 10^{-19}C$) (3 marks)

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(b) In a CRO, waveform given below was displayed on the screen when the sensitivity at the Y plate was10V/cm and time base set at 20 milliseconds/cm.
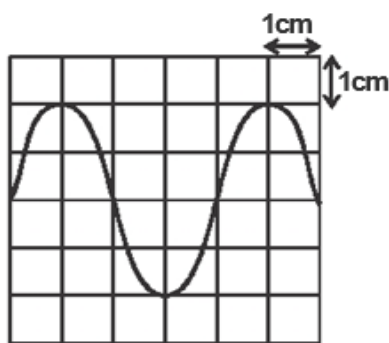
Determine:
(i)   peak voltage   (2 marks)

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(ii)   frequency of the signal   (2 marks)

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14. a) $^{226}_{88} Ra$ decays into $^{222}_{86} Rn$ by emission of an alpha particle. Write a nuclear equation for the decay   (1 marks)

b)
i)   What do you understand by the term half-life of a radioactive substance?   (1 mark)

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ii) A G.M tube registers 20 counts. When a radioactive source is brought close to it, it registers 3220 counts and 120 counts 30 hours later. What is the half-life of this substance? (3 marks)

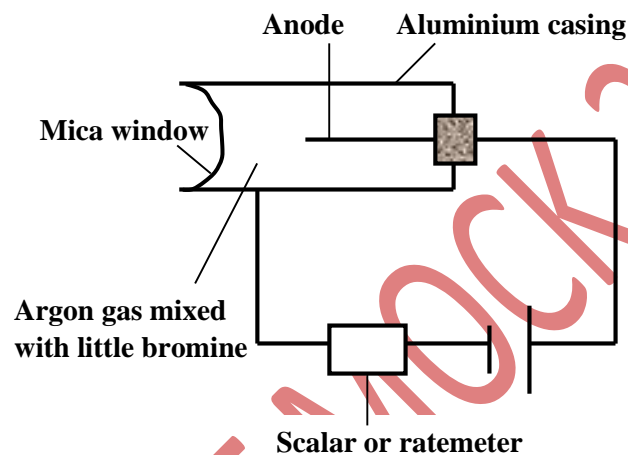………………………………………………………………………………………………………
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c) The figure below shows a G.M tube.

i) What is the purpose of the mica window? (1 mark)

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ii) Explain the purpose of the bromine (2 mark)

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iii) Why should argon gas be kept at low pressure (1 mark)

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iv) What is meant by the term "*dead time"* as used in GM tube (1 mark)

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v) Briefly explain how GM tube works. (2 marks)

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15. (a) State the Ohms Law (1 mark)

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(b) You are provided a rheostat, 2 cell, a voltmeter, an ammeter, a switch and a fixed resistor.
   i) Draw a circuit diagram that can be used to verify Ohms law. (2 marks)

   ii) Describe how the above set up can be used to determine Ohms law. (4 marks)

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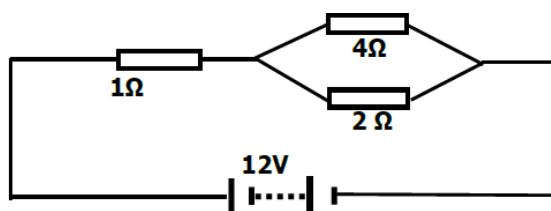…………………………………………………………………………………………………
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(c) **Study** the circuit diagram below and answer the questions that follow.

Calculate
    (i)   Determine the total resistance in the circuit.   (2 marks)

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    (ii)   The current through the 4Ω resistor   (3 marks)

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16. a) State Snell's law   (1mark)

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b) A ray of light travelling from water to glass makes an angle of incident of 30^0. Find the angle of refraction in the glass. Refractive index of water $= {}^4/_3$. Refractive index of glass $= {}^3/_2$ (3 marks)
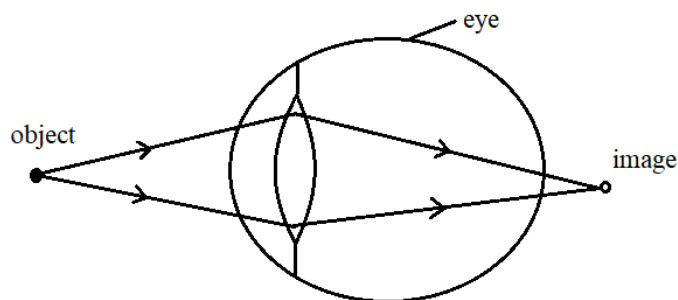
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c) State the necessary and sufficient conditions for total internal reflection to occur.
           (2 marks)

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d) The figure below shows a human eye defect.

(i)   State one possible cause of this defect.   (1 mark)

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(ii)   On the diagram, show how the defect is corrected.   (2 mark)

17. (a) State the Lenz's law of electromagnetic induction.   (1 mark)

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(b) A bar magnet is moved into a coil of an insulated copper wire connected to a zero
centre galvanometer as shown below
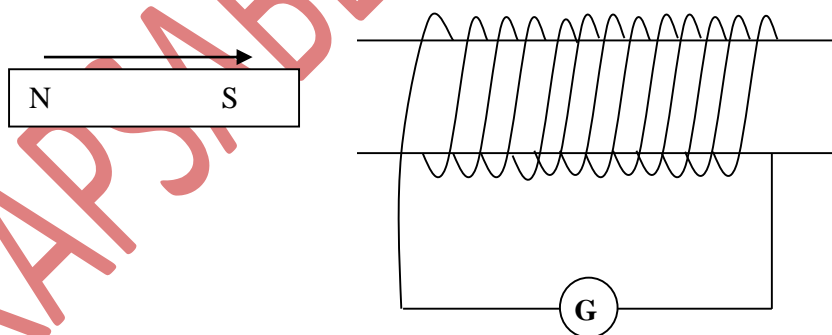
(i)   Show on the figure above the direction of the induced current in the coil
                                                                                (1 mark)

(ii)   State and explain what is observed on the galvanometer when the south pole of the
        magnet is moved into and then withdrawn from the coil.   (2 marks)

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(c) A transformer has 800 turns in the primary and 40 turns in the secondary winding. The alternating voltage connected to the primary is 240V and current of 0.5.A. If 10% of the power is dissipated as heat within the transformer, ddetermine the current in the secondary coil.

(3 marks)

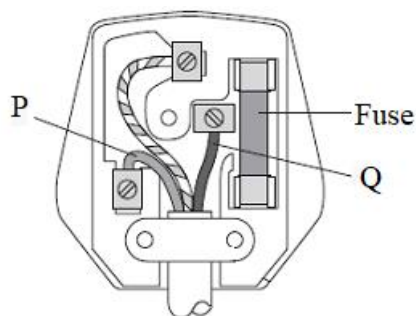………

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(d) The diagram below shows a three-pin plug.

(i) Name the colour of conductors P and Q   (2 marks)

P………………………………………………………………………………………………

Q………………………………………………………………………………………………

(ii) Why is the earth pin longer than the rest in the three-pin plug shown above?
(1 mark)

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