

NAME:..... INDEX NO:...../.....  
SCHOOL:..... CANDIDATE'S SIGN.....  
DATE:.....

232/2

PHYSICS

PAPER 2

JUNE/JULY 2012

TIME: 2 HOURS

## BUTERE DISTRICT JOINT EVALUATION - 2012

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

### INSTRUCTIONS TO CANDIDATES

- a) Write your name and Admission number in the spaces provided.
- b) Sign and write the date of the examination in the spaces provided.
- c) This paper consists of **Two** sections **A** and **B**
- d) Answer **ALL** questions in sections **A** and **B** in the spaces provided.
- e) All working **MUST** be clearly shown.
- f) Non-programmable silent scientific calculators and mathematical tables may be used.
- g) This paper consist of 12 printed pages
- h) Candidates should check the question paper and ascertain that all the pages are printed and that no questions are missing.

### For Examiners' Use Only

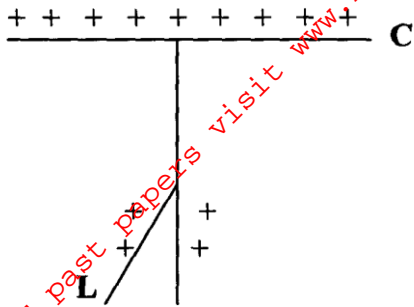
SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1 - 12	25	
B	13	08	
	14	11	
	15	09	
	16	12	
	17	15	
TOTAL		80	

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

## SECTION A (25 marks)

Answer ALL questions in this section in the spaces provided.

1. A gold leaf electroscope is positively charged as shown in the diagram below where **C** is the cap and **L** is the gold leaf. State and explain what happens to **L** when a positively charged rod is brought near **C** without touching it. (2mks)



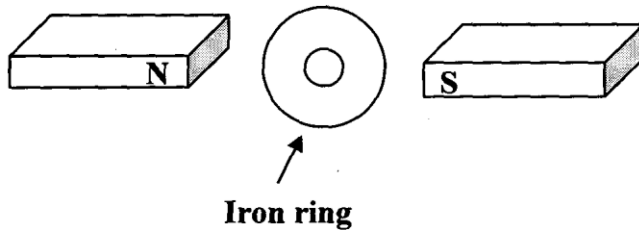
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2. Sketch the magnetic field pattern between the two poles of the magnet shown below. (2mks)



3. State one advantage of generating **a.c** rather than **d.c** voltages in a power station. (1mk)

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4. A metal has a work function of 2.0eV. Calculate the threshold wavelength of the metal given that  $e = 1.6 \times 10^{-19} \text{C}$  and  $h = 6.6 \times 10^{-34} \text{Js}$ . (3mks)

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5. A student designed an a.c generator which produces a current of 10A at a p.d of 340V. State two ways in which he can improve his generator to increase the p.d output. (2mks)

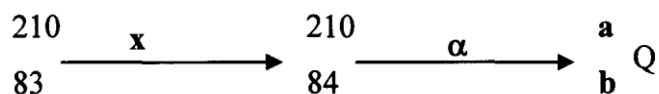
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6. The following equation represents a decay series.



Identify the radiation **x** and determine the values of **a** and **b** (3mks)

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7. State one reason why in the construction of car head lamps parabolic reflectors are preferred to spherical reflectors. (1 mk)

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8. An electric heater  $480\ \Omega$  is connected to a 240V mains supply. Determine the energy dissipated in 4 minutes. (3mks)

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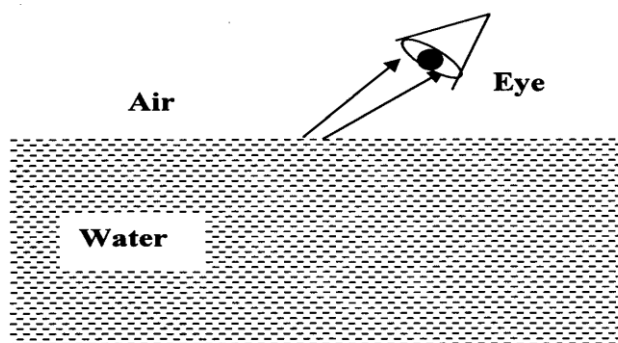
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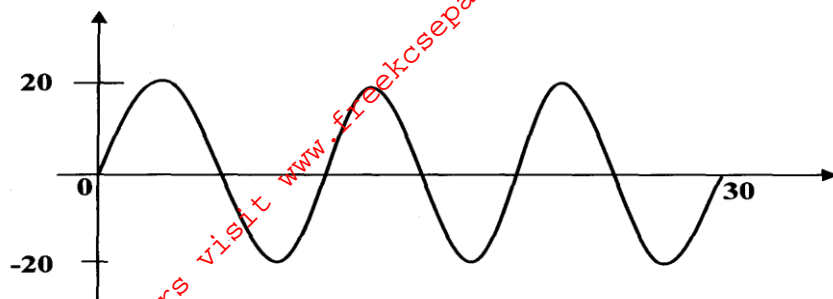
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9. The figure below shows the paths of two rays which enter the extremities of the eye from a small object immersed in water.



Draw lines on the diagram to show a possible apparent position of the object and its true position (2mks)

10. The diagram below shows part of a wave form. The numbers on the diagram show scales in meters. If the speed of the wave is  $20\text{ms}^{-1}$ , determine the frequency and wavelength of the wave. (3mks)



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11. The chart below shows an arrangement of different parts of the electromagnetic spectrum.

<b>Radio</b>	<b>A</b>	<b>Visible</b>	<b>B</b>	<b>X – Rays</b>	<b>Gamma Rays</b>
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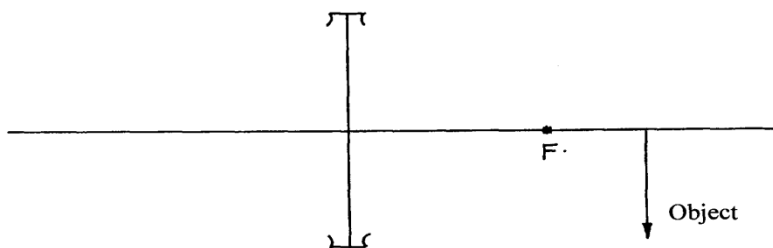
Name the possible radiations represented by letter **B**.

(1mk)

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12. The diagram below shows an object placed some distance from a biconcave lens.



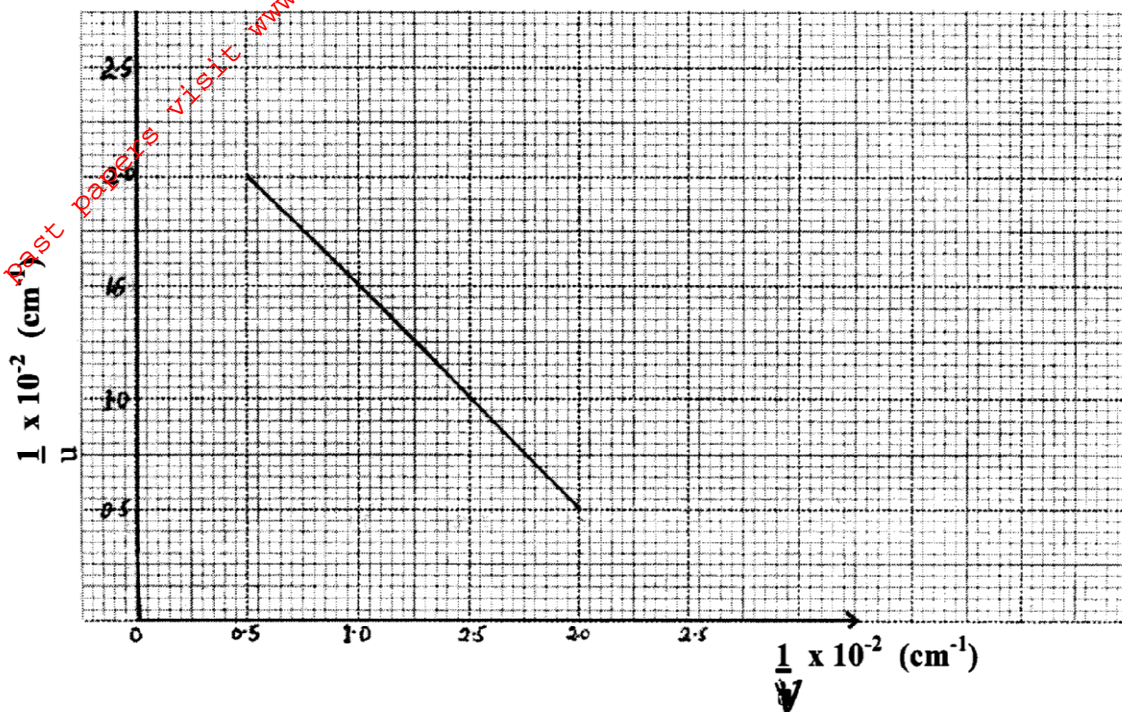
Construct the image on the diagram

(2mks)

## SECTION B (55 MARKS)

Answer ALL questions in this section in the spaces provided after each question.

13. a) The graph below shows the relationship between  $1/u$  and  $1/v$  for a converging lens where  $u$  and  $v$  are the object and image distances respectively.



From the graph, determine the focal length,  $f$  of the lens

(4mks)

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- b) State two conditions necessary for total internal reflection to occur.

(2mks)

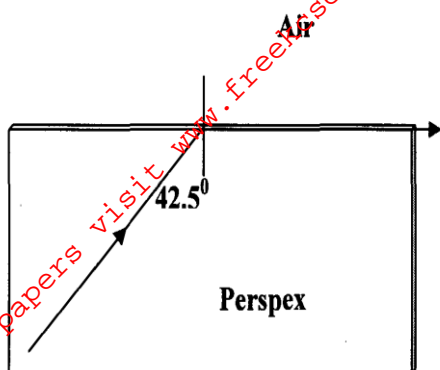
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- c) The figure below shows the path of a ray of light passing through a rectangular block of Perspex placed in air.



Calculate the refractive index of Perspex. (2mks)

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14. a) (i) State two properties of X — rays (2mks)

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- (ii) In a certain X-ray tube, electrons are accelerated by a potential difference of 10KV. Assuming that 5% of the energy is converted into X — rays, determine the frequency of the X-rays produced. ( $h = 6.62 \times 10^{-34} \text{Js}$ ,  $e = 1.6 \times 10^{-19} \text{C}$ ) (3mks)

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b) Describe how a P-type semiconductor is formed

(3mks)

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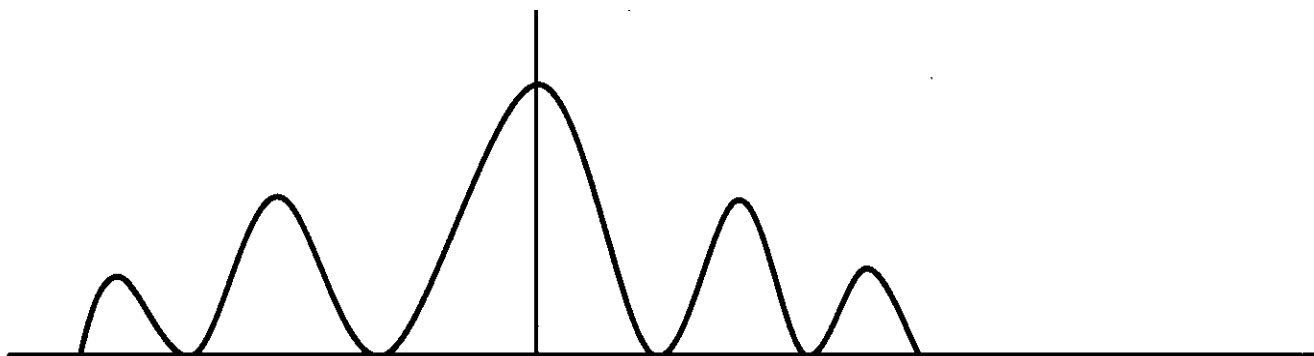
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c) The diagram below shows results obtained in an experiment to study diffraction patterns in a double slit experiment.



Explain the shape of the graph.

(3mks)

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15. a) The figure below shows a transverse stationary wave along a string.



i. Label the nodes and antinodes.

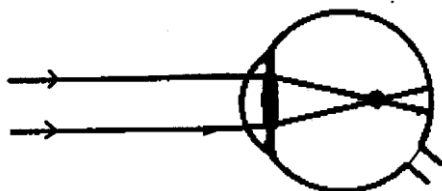
(1 mk)



- ii. If the distance between an anti-node and a node is  $1.0 \times 10^{-3} \text{ m}$ , determine the wavelength of the stationary wave. (2 mks)

- b) Five successive wave-fronts in a ripple tank are observed to spread a distance of 6.4 cm. If the vibrator has a frequency of 8 Hz, determine the speed of the waves. (2 mks)

- c) The figure below shows one of the common eye defects.



- i. State the type of defect and its possible cause. (2 mks)

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- ii. On the same diagram, show how the defect can be corrected (2 mks)

16. a) State two ways of increasing the capacitance of a parallel plate capacitor (2mks)

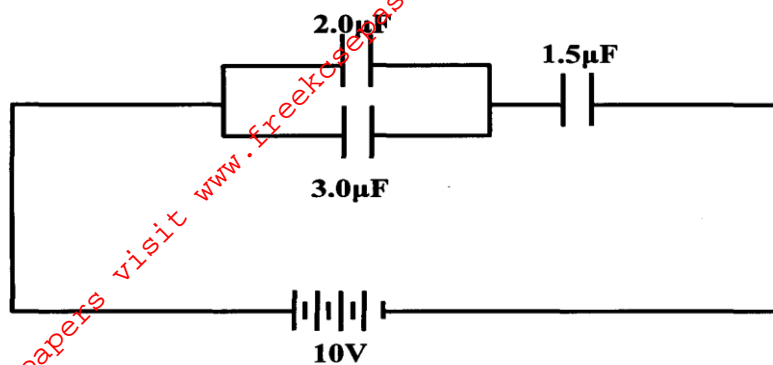
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- b) The figure below shows a capacitor network setup.

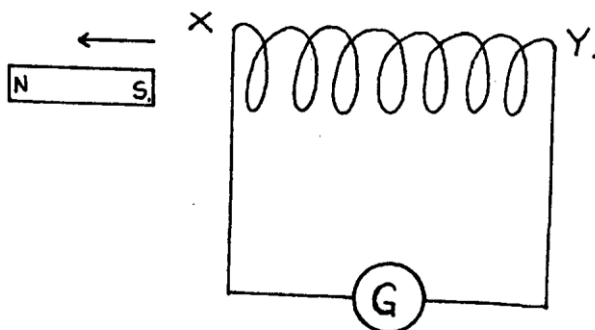


Calculate the charge stored by the  $1.5 \mu\text{F}$  capacitor.

(3mks)

- c) Indicate the direction of the current in the coil in the set up below. Label the polarity at the points marked X and Y

(3mks)



- d) In a radio therapy unit of a hospital, a transformer is used to supply a potential difference of 150 KV to an X — ray tube from a 240 V a.c. mains supply. A current of 100 m A flows in the X-ray tube. Assuming the transformer is 100 % efficient, calculate

i. Current in the primary coil (2 mks)

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ii. The turns ratio of the transformer (2mks)

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17. (a) What do you understand by the term **e.m.f** of a cell?. (1mk)

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- (b) A cell of e.m.f **E** and internal resistance **r** is used to pass a current through various resistors **R**, Ohms and the values of current recorded in the table below.

<b>R(Ohms)</b>	<b>1.6</b>	<b>2.1</b>	<b>2.5</b>	<b>3.6</b>	<b>5</b>	<b>8</b>
<b>i(A)</b>	<b>1</b>	<b>0.8</b>	<b>0.7</b>	<b>0.5</b>	<b>0.37</b>	<b>0.24</b>
<b>1/i(A<sup>-1</sup>)</b>						

- i. Complete the table for the values of **1/i** giving your answer to 3 d.p. (3mks)
- ii. Plot a graph of **1/i** versus **R**. (5mks)
- iii. Given that the equation **E = I(R + r)**, use your graph to determine the values of **E** and **r**. (5mks)

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