Name: …… **Index No.** ……

School: …… **Candidate's Sign.** …….....

Date: ……

232/2
PHYSICS
PAPER 2
JULY/AUGUST 2011
TIME: 2 HOURS

RACHUONYO SOUTH DISTRICT JOINT EVALUATION TEST

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

Physics
Paper 2

INSTRUCTIONS TO THE CANDIDATES:

- Write your **name** and **index number** in the spaces provided above
- This paper consists of ***two*** sections **A** and **B.**
- Answer ***all*** questions in section **A** and **B** in the spaces provided.
- All working ***must*** be clearly shown in the spaces provided.
- Mathematical tables and electronic calculators may be used.

For Examiners' Use Only

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-12	25	
B	13	11	
	14	7	
	15	7	
	16	11	
	17	10	
	TOTAL	**80**	

This paper consists of 8 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing

SECTION A: (25MARKS)

Answer all the questions in this section

1. 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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2. Distinguish between intrinsic and extrinsic semi-conductors. (1mk)

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

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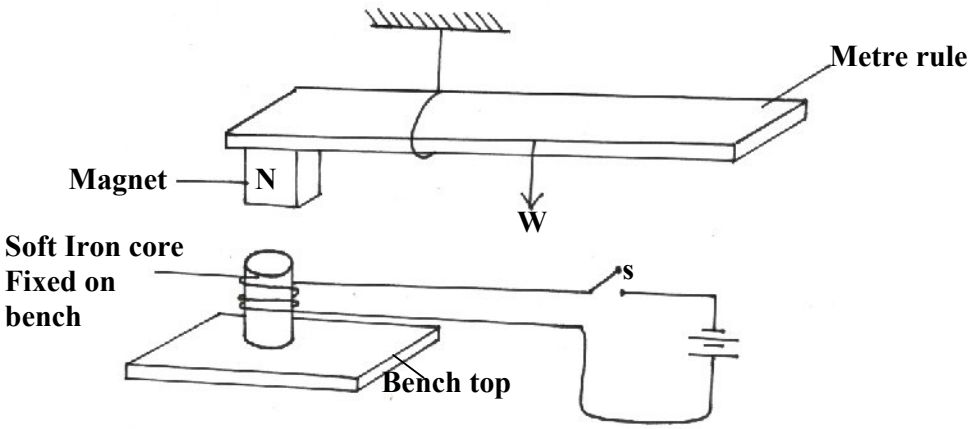
4. The figure below shows a metre rule in equilibrium with the magnet and weight W .The Soft iron core is fixed to the bench



State and explain the effect on the metre rule when the switch S is closed (2mks)

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5. Arrange the following radiations in order of increasing wavelength Ultra-violet, Microwaves, Blue light, Yellow light. (1mk)

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6. An electric bulb is rated 75W,240V. Determine the resistance of the bulb. (3mks)

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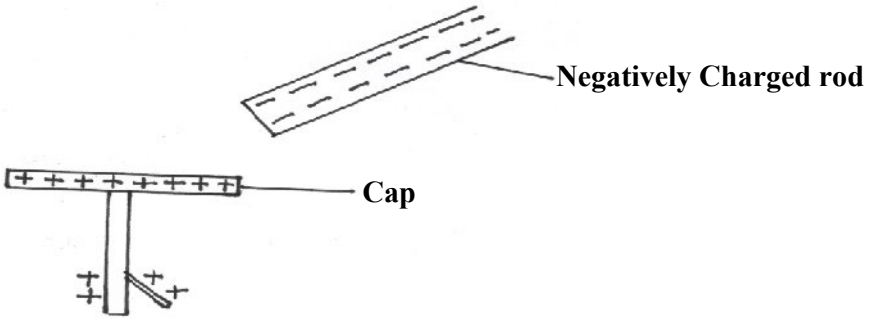
7. The figure below shows a highly negatively charged rod being brought slowly near the cap of a positively charged leaf electrocscope. It is observed that the leaf initially fall then rises.



Explain this observation. (2mks)

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8. The acceleration potential of a certain X-ray tube is increased. State the change observed on the X-ray produced. (1mk)

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9. The energy of a radiation is 3.8×10^{-14} J. Determine the wavelength of the radiation ($h = 6.63 \times 10^{-34}$JS, $C = 3.0 \times 10^{8}$m/s) (3mks)

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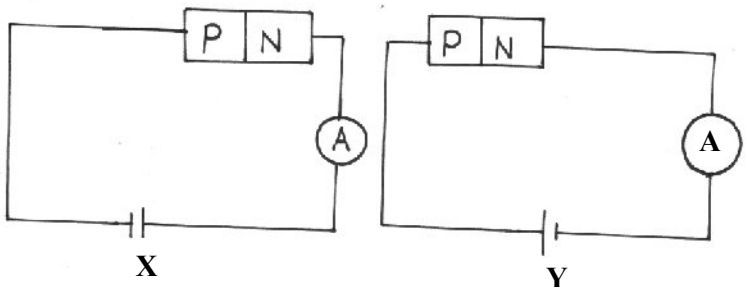
10. The figure below shows two ways of biasing a P-N junction



(i) In which circuit will current flow? (1mk)

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(ii) Explain your answer in (ii) above. (1mk)

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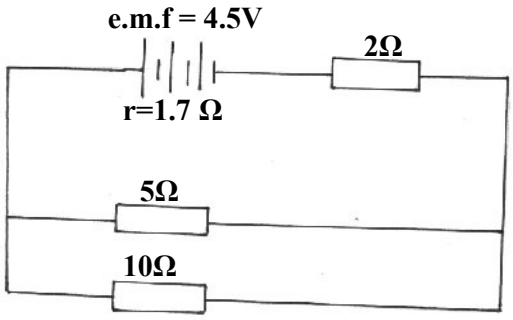
11. Determine the amount of current passing through the 2Ω resistor shown in the figure below. (3mks)



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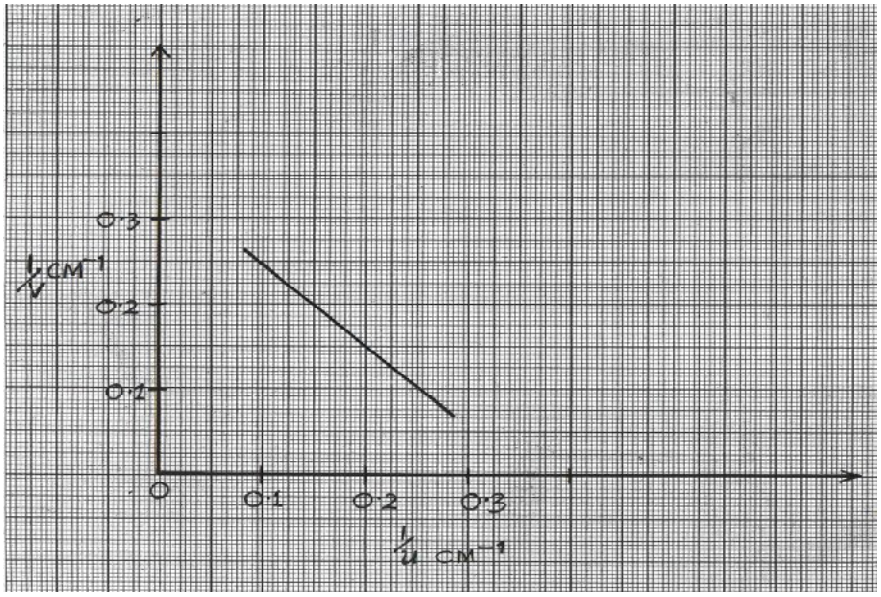
12. The graph below shows the variation of I/v and I/u in an experiment used to determine the focal length of a lens.



Use the graph to determine the focal length of the lens. (3mks)

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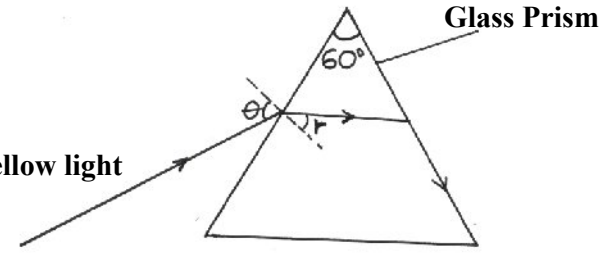
SECTION B (55 MARKS)

Answer all the questions from this section.

13. The figure below shows the path of a ray of yellow light through a glass prism. The speed of yellow light in the prism is 1.88×10^8 m/s



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

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(b) Show on the same figure above, the critical angle C, and determine its value. (4mks)

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(c) Given that r = 31.2 determine the angle θ (3mks)

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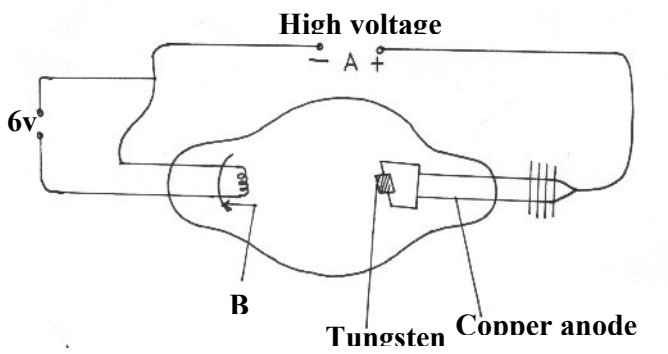
(d) On the same figure sketch the path of light after striking the prism if the prism was replaced by another one of lower refractive index. (Use dotted lines for your answer.) (1mk)

14. The diagram below represents an X –ray tube. The anode is made up of copper metal and tungsten as the target.



a) What are the functions of parts A and B. (2mks)

A…….

B……..

b) Explain how X-rays are produced from the tube. (2mks)

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c) Why is tungsten used for the target in the tube? (1mk)

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d) How can the quality of X-rays produced be controlled in the tube? (1mk)

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e) How can the quantity of the X-rays be increased? (1mk)

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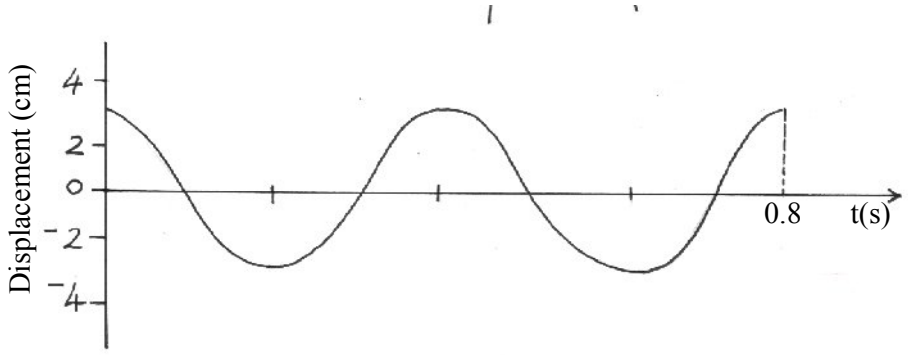
15. The figure below shows the displacement-time graph of a wave traveling at 400cm/s.



Determine for the wave, the :

(i) Amplitude (1mk)

(ii) Period (1mk)

(iii) Frequency (2mks)

(iv) Wavelength (3mks)

16. a) State Ohm's law. (1mk)

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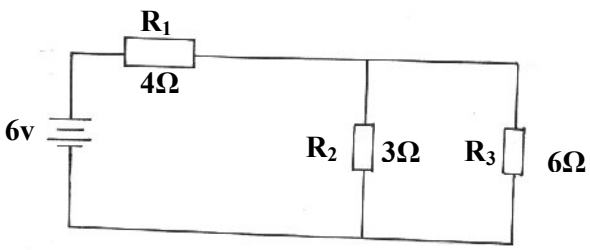
b) The figure below shows a circuit.



Calculate:

i) The total resistance of the circuit. (3mks)

ii) The total current flowing in the circuit (2mks)

iii) The voltage drop across resistor R_1 (2mks)

iv) The current through the 3Ω resistor (3mks)

17. a) State Faraday's law of electromagnetic induction (1mk)

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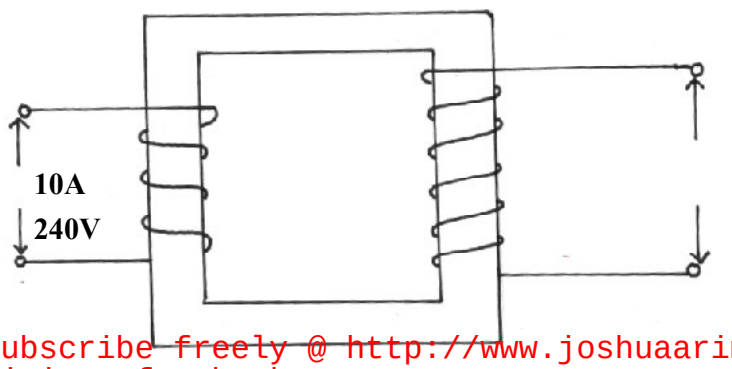
b) The diagram below shows a step-up transformer.



Input **Output**

Calculate:

i) The power input to the transformer (2mks)

ii) The power dissipated as heat in the primary coil of resistance 2 Ω (2mks)

iii) The power out put from the transformer (2mks)

iv) The efficiency of the transformer (3mks)

18. a) Define background count. (1mk)

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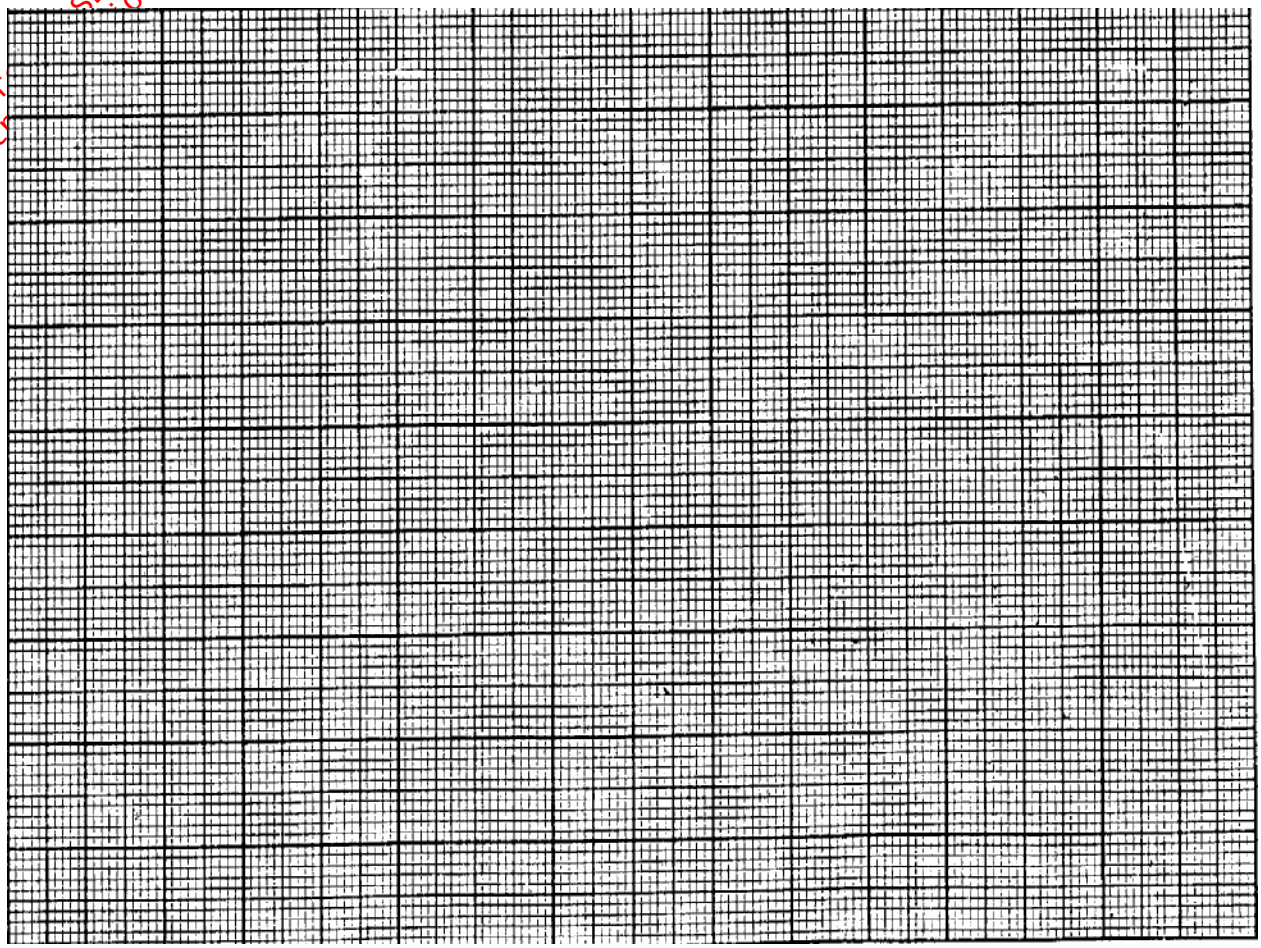
b) Radon nuclide $^{222}_{86}Ra$ decays to form polonium by emitting an α- particle use a suitable equation to show this decay (2mks)

c) In an experiment to determine the half-life of the radioactive element. The following data was obtained.

Activity (count) per minute	0	4	8	12	16
Time (minutes)	800	520	345	225	145

(i) Plot a decay curve for the element (5mks)



(ii) Estimate from your graph the half-life of the element. (1mk)