Name:…… Index Number:..……/…… Adm No……

232/1
PHYSICS
Paper 2
2 Hours
June 2010

KASSU JOINT EVALUATION TEST (J.E.T)

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

PHYSICS
Paper 2
2 Hours

Instructions to Candidates

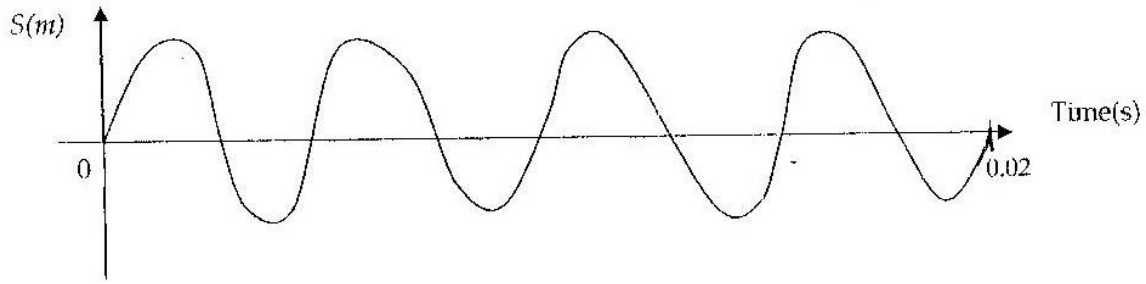
- *Write your name and index number in spaces provided above.*
- *This paper consists of two sections: A and B.*
- *Answer ALL the questions in sections A and B in the spaces provided.*
- *ALL working MUST be shown clearly*
- *Mathematical tables and silent electronic calculators may be used.*
- *Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.*

For Examiner's Use Only

Section	Question	Maximum score	Candidate's score
A	1-11	25	
B	12	14	
	13	7	
	14	12	
	15	11	
	16	11	
	Total Score	**80**	

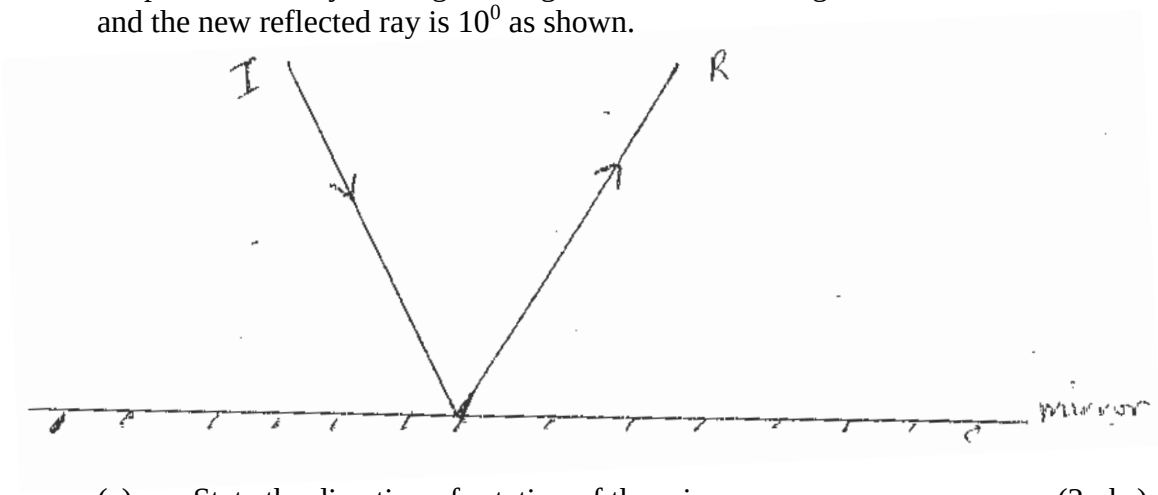
*Answer **ALL** the questions in this section in the spaces provided.*

1. Why is it safer to carry explosive fuels in metal cans instead of plastic can? (2mks)
2. State one of the properties of a magnet. (1mk)
3. The sketch is a displacement – time graph of a wave traveling at $320ms^{-1}$.



Find the wavelength of the wave. (2mks)

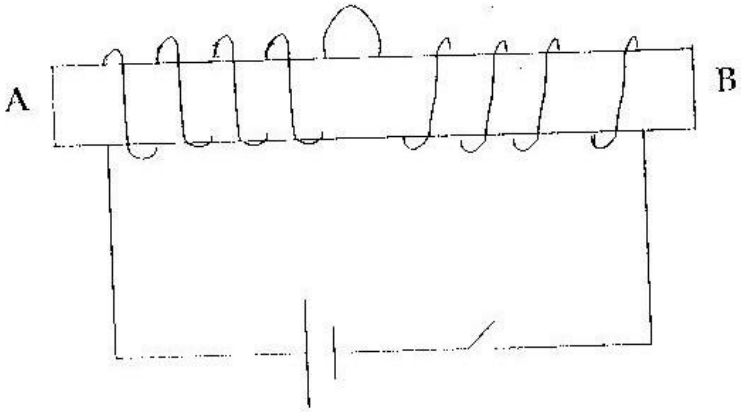
4. A ray of light falls on a plane mirror such that the reflected ray makes an angle of 20^0 with the incident ray. The mirror is then turned about an axis of right angles to the plane of the rays through an angle θ such that the angle between the incident and the new reflected ray is 10^0 as shown.



(a) State the direction of rotation of the mirror. (2mks)

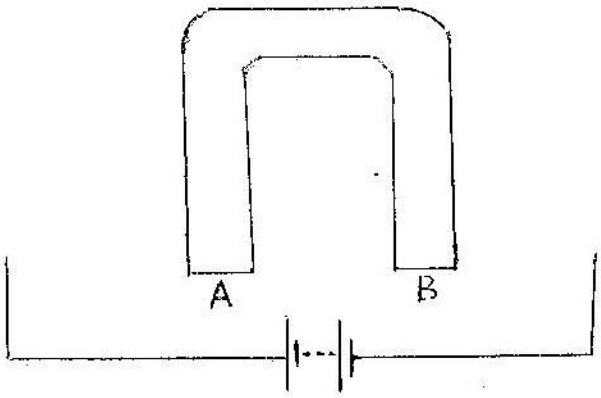
(b) Determine the angle of rotation θ of the mirror. (2mks)

5. A student made a simple electromagnet by winding a coil of insulated copper around an iron bar as shown.



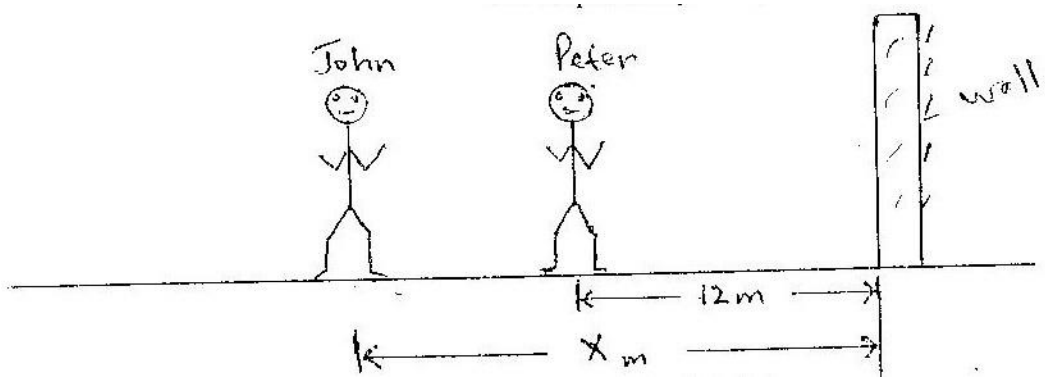
(a) Determine the polarity of A and B. (1mk)

(b) Another student used a U-shaped iron bar to make an electromagnet.



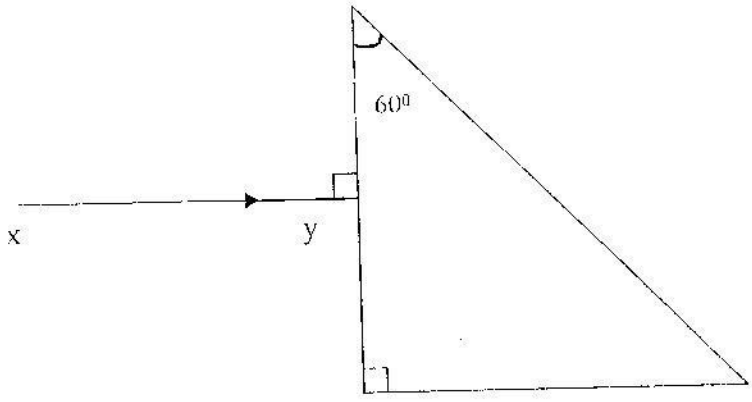
Complete the windings such that both A and B are N-poles. (2mks)

6. Peter and John are 12m and X metres respectively away from a wall as shown.

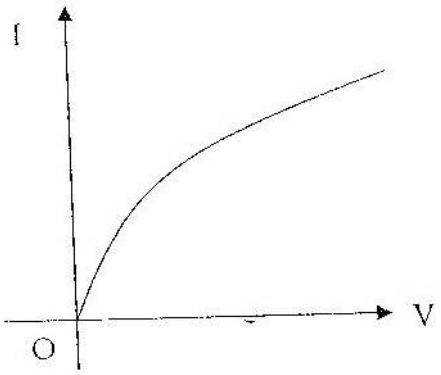


Peter claps his hands once. John hears the echo 0.4s later. Calculate the distance between John and Peter. (Speed of sound in air = $330ms^{-1}$) (3mks)

7. Complete the path of the ray XY shown until when it leaves the glass prism, given that the critical angle fro glass is 42^0. (Show all the angles). (3mks)
($n = {}^3/_2$ for glass)



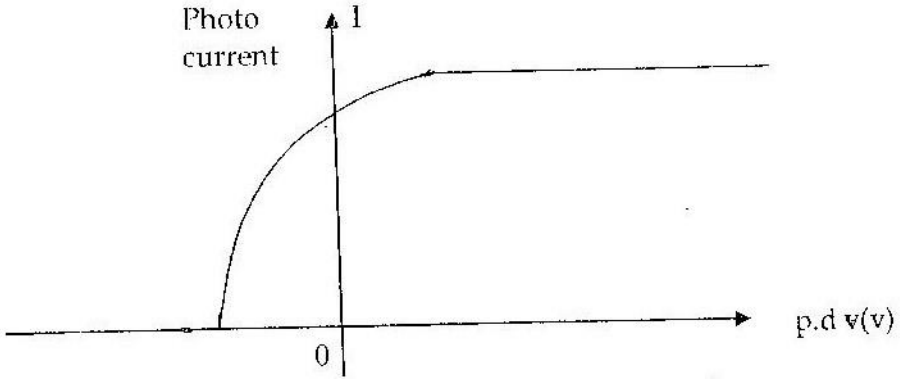
8. The current-voltage (I-V) graph for a torch bulb is as shown below.



Draw the circuit diagram you would use for the experiment. (2mks)

9. An electric heater is found to have a resistance of 950Ω when operating normally on a 240V mains.
Find the power rating of the heater. (2mks)

10. The graph below is a sketch of photo current against the potential difference across the terminals of a photocell when radiated with light of frequency f and intensity t.



On the same axes sketch the graph of the photo current against the potential difference (p.d) when the photocell is radiated with light of:

(a) Higher frequency and of same intensity t. (1mk)

(b) Lower intensity and of same frequency f. (1mk)

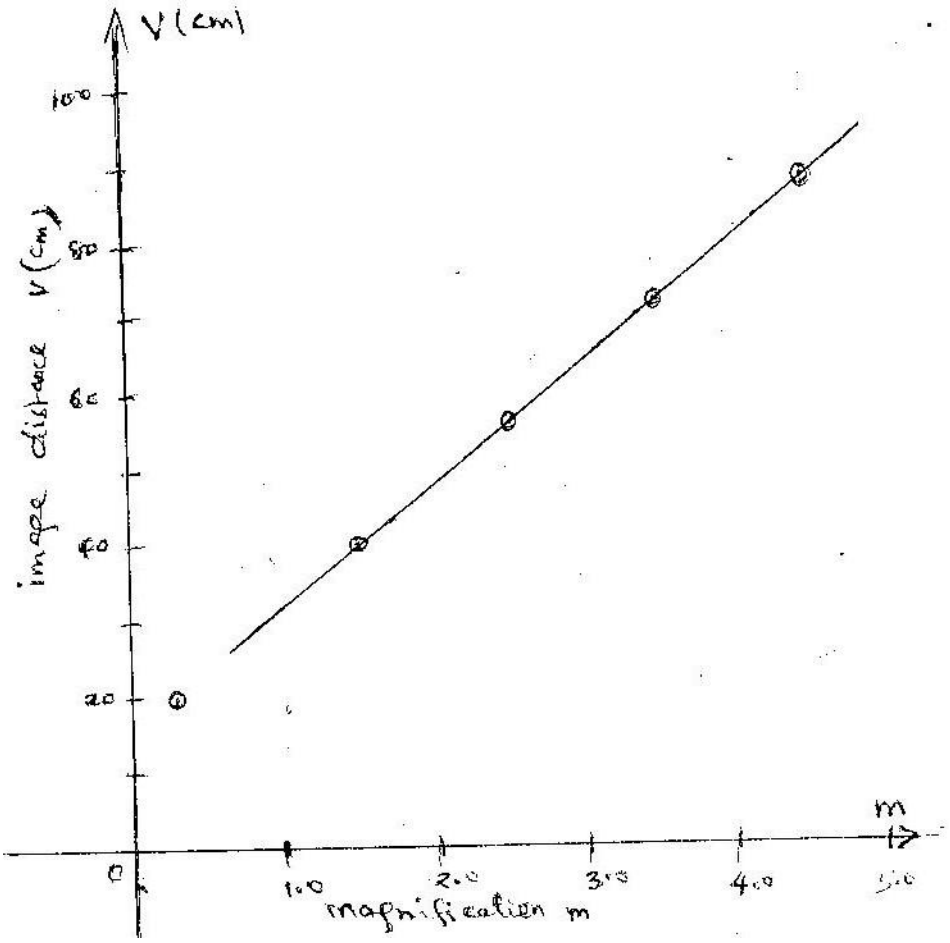
11. Name one region of the electromagnetic spectrum which has a wavelength greater than visible light and state briefly how the radiation can be produced. (2mks)

SECTION B (55 MARKS)

12. (a) A magnified erect image and a magnified inverted image both can be formed by a concave mirror. Draw ray diagrams to show this. (4mks)

(b) Show using a diagram how a parabolic reflector propagates parallel beam of light. (1mk)

(c) In an experiment using a concave mirror a graph of image distance V against the magnification m was drawn as shown, from the equation $^{v}/_{s}=m+1$.



From the graph determine.

(i) The slope S. (3mks)

(ii) The y-intercept (V-intercept), c (1mk)

(iii) Calculate the value of constant n given that $n = \frac{S + C}{2}$ (2mks)

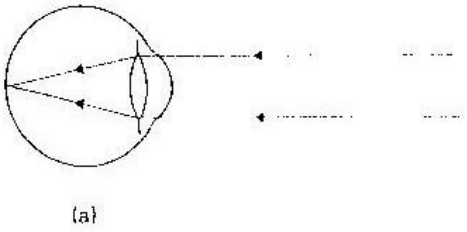
(iv) What is the physical significance of the value n? (1mk)

13. (a) An object 2cm tall is placed 22.5cm from a convex lens of focal length 15cm. on the other side of the converging lens, a diverging lens of focal length 30cm is placed such that the distance between the lenses is 35cm. Determine by scale drawing on the grid provided.

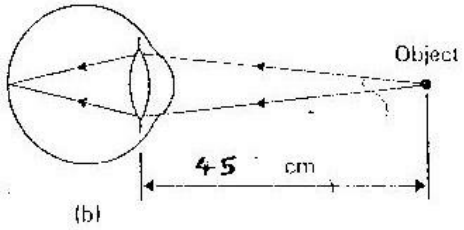
(i) The position of the final image. (4mks)

(ii) The total magnification. (2mks)

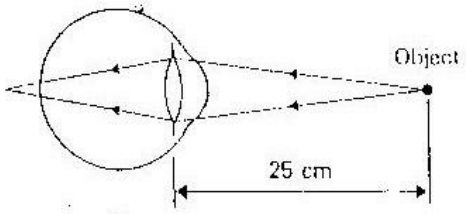
(b) The diagram below represents a human eye receiving light from (a) a distant source (b) a point 45cm from the eye (c) a point 25cm from the eye.



(a)



(b)

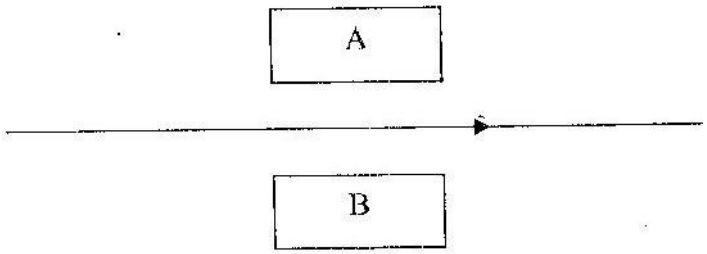


(c)

(i) Name the eye defect. (1mk)

(ii) What type of spectacles would be required for correction? Determine its focal length. (3mks)

14. (a) The arrow in the fig. represents a stream of electrons moving in the plane of the paper as shown.

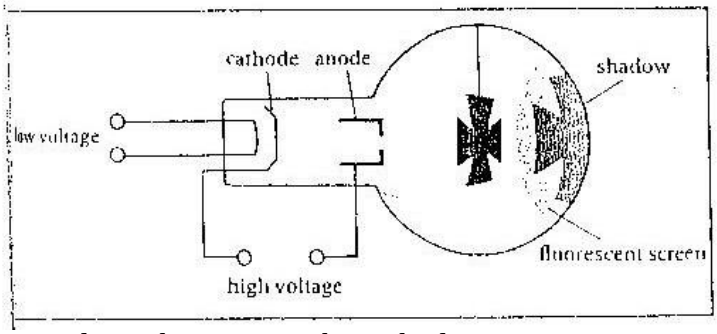


How would the stream be deflected relative to the paper if:

(i) A is a N-pole and B is a S-pole. (1mk)

(ii) A is negatively charged and B is positively charged. (1mk)

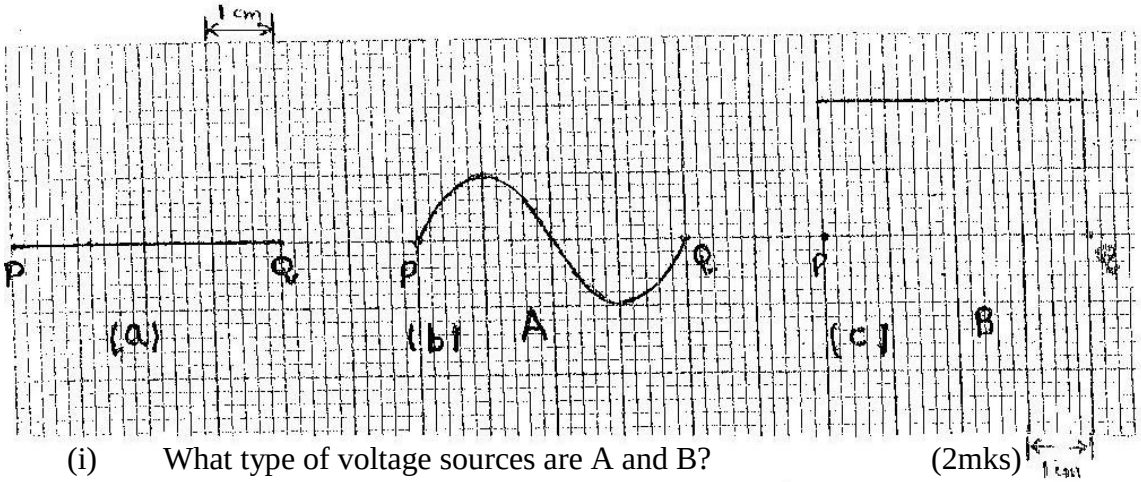
(b) The fig. shows as simple form of cathode ray tube, which produces a sharp shadow of a maltese cross on a fluorescent screen.



(i) Explain what is meant by cathode rays. (2mks)

(ii) What property of cathode rays does the fig. above illustrate and name two other properties. (3mks)

(c) A cathode-ray oscilloscope is adjusted so that the time for the electron beam to make one traverse of the screen from P to Q is $^{1}/_{100}$ of a second and the Y – plate sensitivity is 1cm represents 15V. The trace on the screen is then as in fig. (a), fig. (b) and (c) shows the trace obtained when the C.R.O. is connected in turn to two voltage sources A and B.



(i) What type of voltage sources are A and B? (2mks)

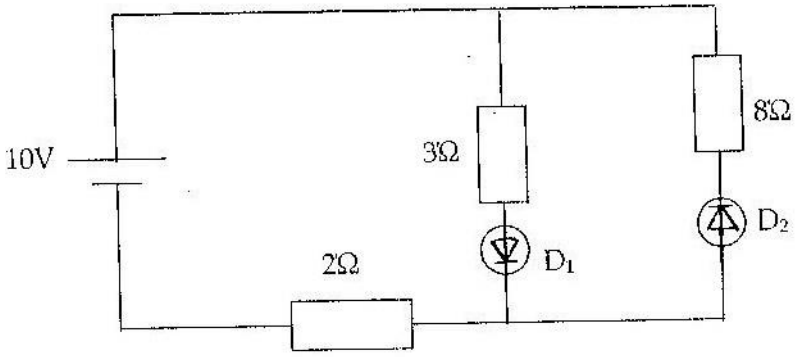
(ii) What is the voltage of B and the peak voltage of A? (2mks)

(iii) What is the frequency of source A? (2mks)

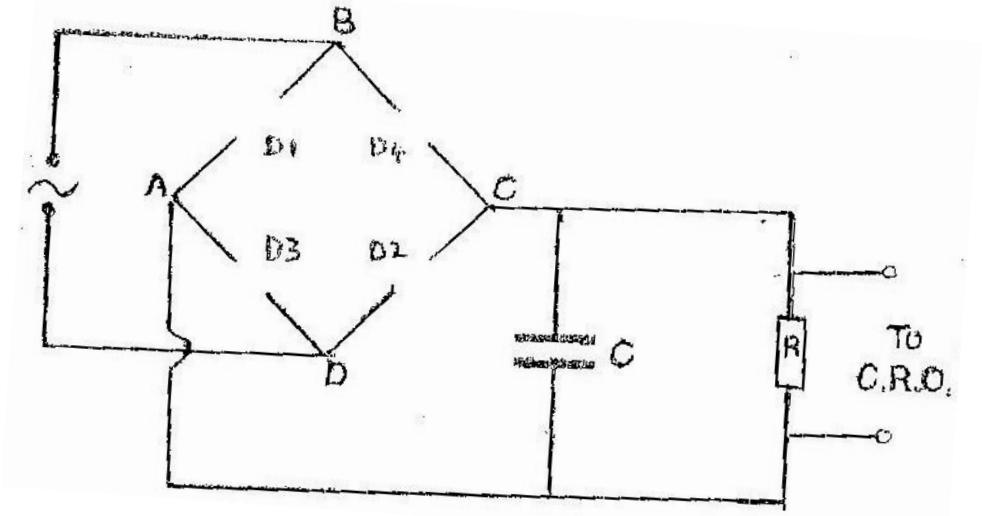
15. (a) Explain why the conductivity of a metallic conductor decreases with increase in temperature while that of an intrinsic semiconductor increases with increase in temperature. (2mks)

(b) Explain what happens to the depletion layer when diode is reverse biased. (2mks)

(c) Find the current flowing and the voltage across the 8Ω resistor in the circuit. (2mks)



(d) The figure shows a circuit used for a full wave bridge rectification.



(i) Insert diodes D1, D2, D3 and D4 to complete the circuit. (2mks)

(ii) What is the use of capacitor C? (1mk)

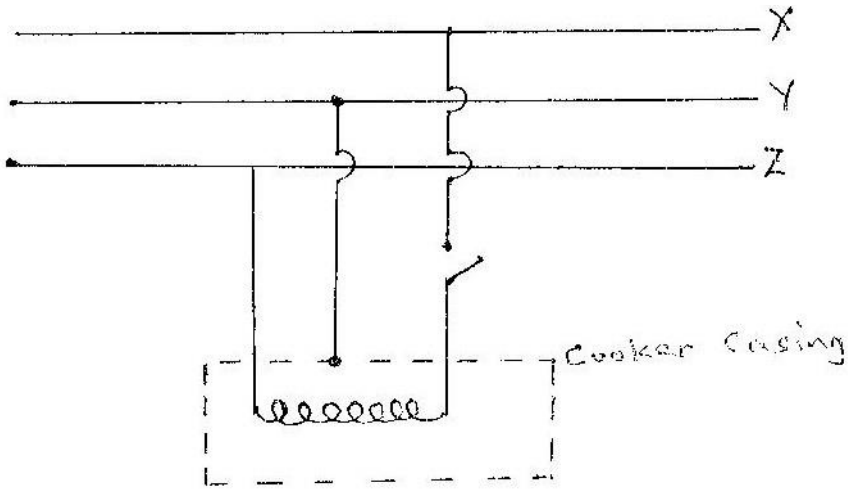
(iii) On the axes below draw a voltage – time display of the rectification observed on the C.R.O. (2mks)

16. (a) Electrical energy is distributed as alternating current (a.c) at high voltage. Explain why:

(i) A very high voltage is necessary. (1mk)

(ii) Thick aluminium transmission lines are recommended to carry the current. (2mks)

(b) The figure shows the electric wiring of an electric cooker X, Y and Z are main wires.



Identify Y and X giving reasons. (2mks)

(c) A student has a large number of 240V, 60W coloured bulbs he wishes to use for decorations so that the bulbs operate normally.

(i) How many bulbs can be connected to a 240V supply through a 5A fuse? (2mks)

(ii) If electric energy cost Kshs. 3.00 per unit, what will be the cost of running the above circuit for 5 hours a night for 20 nights? (2mks)