NAME…….INDEX……..ADM NO…….. DATE……

SCHOOL ……..STREAM……SIGNATURE……

232/2
PHYSICS
PAPER 2
MAY 2014
2 HOURS

BUNYORE – MARANDA JOINT PRE-MOCK EXAM – 2014

Kenya Certificate of Secondary Education

232/2
PHYSICS
PAPER 2
MAY 2014

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided above
- This paper consists of two sections A and B
- Answer all the questions in the spaces provided
- All working must be clearly shown in the spaces provided
- Mathematical tables and electronic calculators may be used
- Take velocity of light 3.0 x 10^{8}ms^{-1} and plank's constant h = 6.63x10^{-34} *Js*; charge on an electron e = 1.6x10^{-19} C.

For Examiner's Use Only

Section	Question	Maximum	Candidate's Score
A	1-10	25	
B	11	11	
	12	10	
	13	13	
	14	11	
	15	10	
		80	

SECTION A (25 MARKS)

1. Explain why sharp shadows support the theory that light travels in straight lines (1 mark)

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2. State one application of total internal reflection (1 mark)

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3. a) Give two reasons why radioactive disintegration is different from ordinary chemical changes? (2 marks)

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b) A radioactive isotope $^{232}_{90}TH$ emits two alpha particles and two beta particles as a result of four successive disintegration. If the daughter product is represented as $^{A}_{Z}Y$. Work out the values of A and Z. (2 marks)

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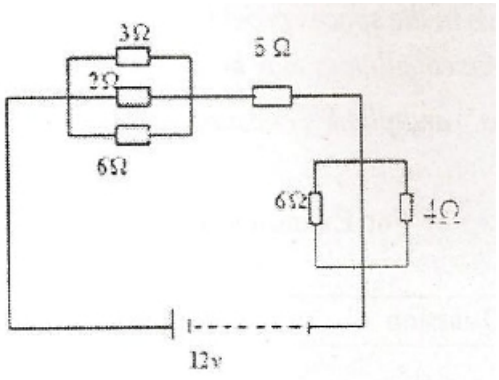
4. Use the circuit in fig (10) below to answer the questions that follow.



(a) Calculate the total resistance in the circuit. (2 marks)

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(b) Calculate current the effective current in the circuit (2 marks)

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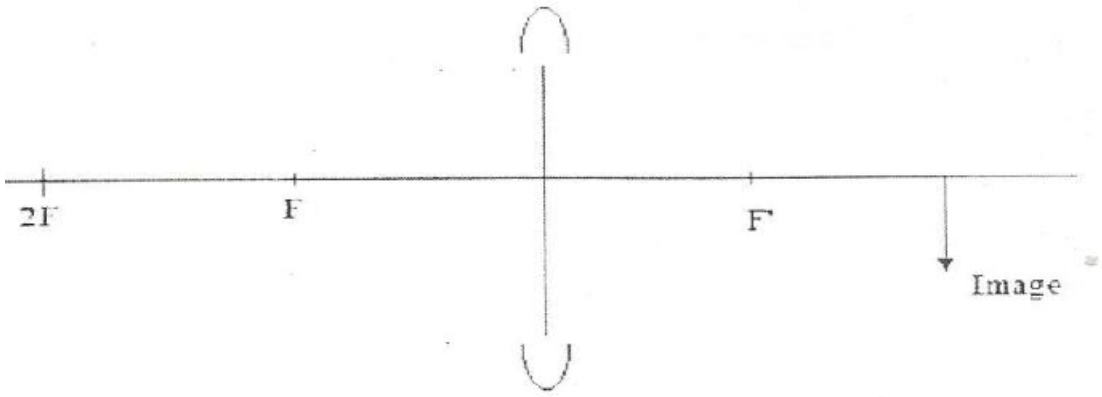
(i) The sketch below shows an image placed some distance from a biconvex lens.



Draw rays to locate the image on the diagram (2 marks)

(ii) A biconcave lens forms an erect image twice the size of the object. If the focal length of the lens is 20cm, determine the object distance. (2 marks)

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5. P-type and n-type semi-conductors are made from a pure semi-conductor by a process known as doping.

(i) What is meant by doping (1 mark)

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(iii) Explain how doping produces an n-type semi-conductor (2 marks)

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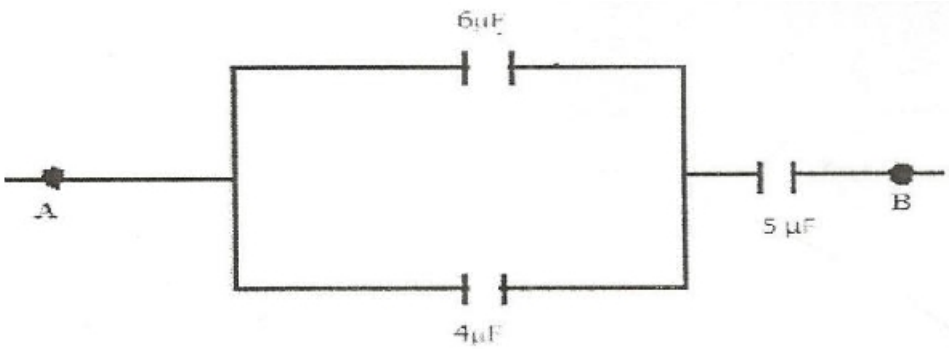
6. The figure below shows part of a circuit containing three capacitors of 4μF, and 5μF respectively.



Determine the p.d across the 5μF capacitor given that the total charge stored in the capacitors is 0.0000052 C. (3 marks)

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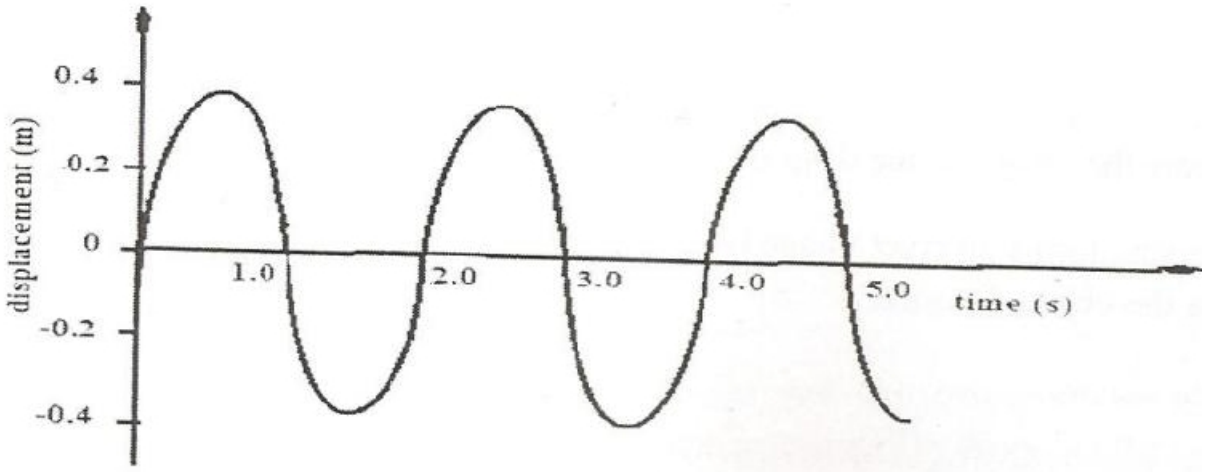
7. Figure 5 below shows how the displacement varies for a certain wave.



Determine the frequency of the wave. (2 marks)

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8. Arrange the following in order of increasing frequencies: Red, Green, yellow, Infra-red, (1 mark)

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9. Determine the largest number of 75W bulbs which can be safely used to run on a 240V source with a 5A fuse. (2 marks)

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SECTION B (55 MARKS)

10. (i) Distinguish between the term principal focus and focal length (1 mark)

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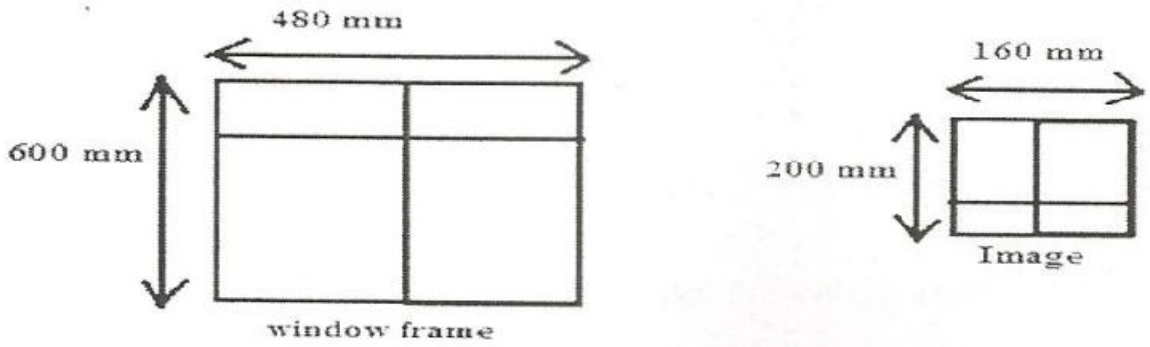
(ii) The figure below shows scale drawing of a window frame and its image produced on a screen by a convex lens.



a) State the nature of the mage formed (1 mark)

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b) Calculate the linear magnification of the image (2 marks)

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c) The image of the frame was produced 500mm from the lens. Calculate:

I. The distance of the actual frame from the lens (2 marks)

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II. The focal length of the lens (2 marks)

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iii) A student finds that at a distance of 25cm the words in a book look blurred.

a) What eye defect is the student suffering from (1 mark)

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b) In which direction does he move the book to be able to see the words clearly from the distance. (1 mark)

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c) Which lens can be used to correct the above defect (1 mark)

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11. a) Define the term "Work function" (1 mark)

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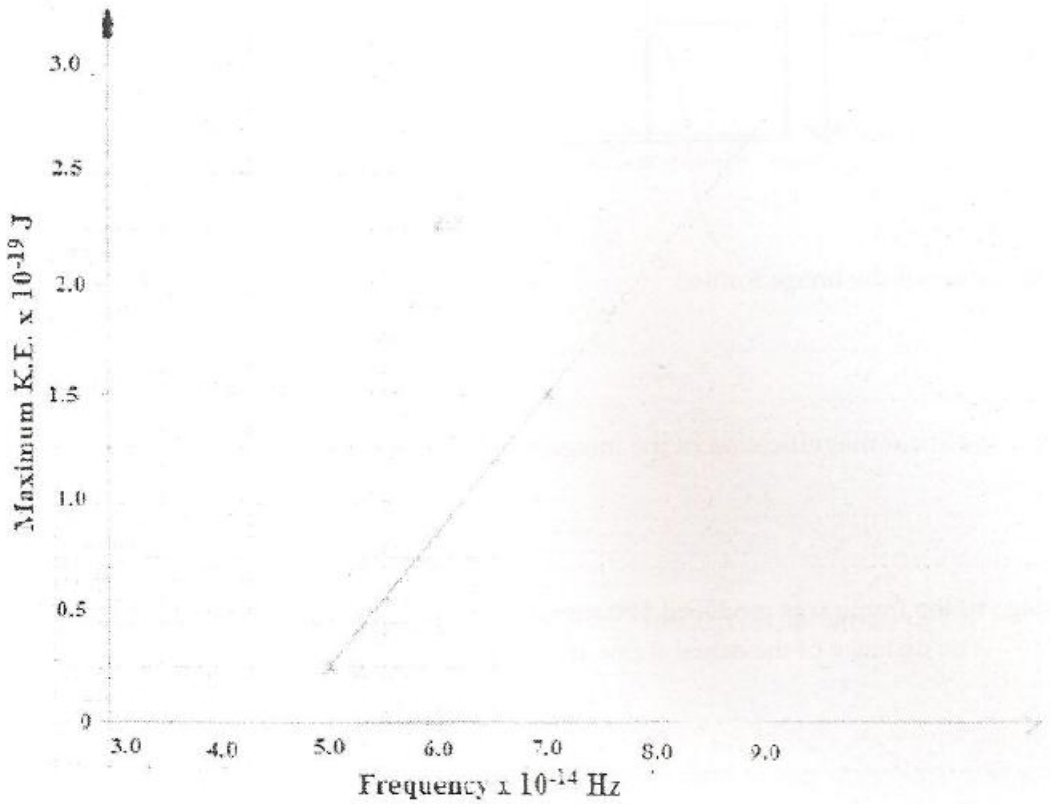
b) A student investigated how the maximum kinetic energy of the photoelectrons, emitted form a zinc cathode, varies with the frequency of the incident radiation. The results obtained were plotted as shown on the graph below.



From the graph determine: -

(i) The plank's constant (3 marks)

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(ii) The work function of the cathode (3 marks)

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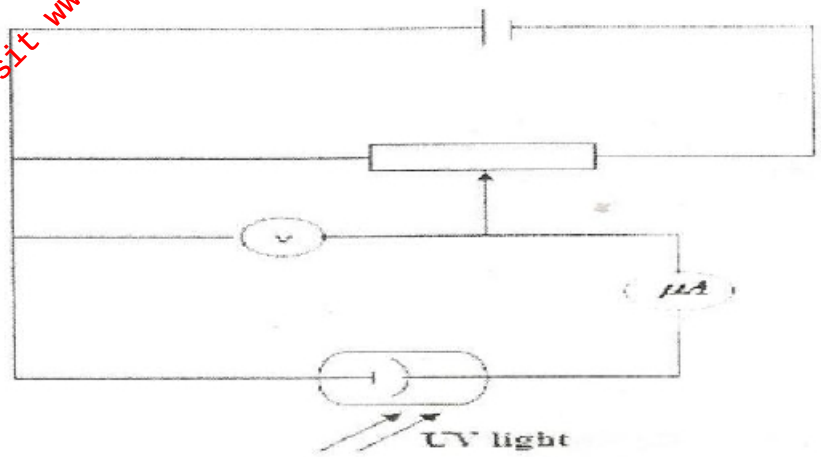
(b) The figure below shows the diagram of a setup used in an experiment to investigate photo-electricity. The frequency of the ultra-violet light was constant throughout the experiment.



Sketch on the same axes the graphs of photo-electric current (y-axis) against the voltage for two different intensities A_1 and A_2 of ultra-violet where $A_1 > A_2$ (3 marks)

12. a) A hydro-electric power station produces 500KW at a voltage of 10KV. The voltage is then stepped up to 150KV and power is transmitted through cables of resistance 200Ω a step down transformer in a sub-station. Assuming that both transformers are 100% efficient calculate;

(i) The current produced by the generator (2 marks)

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(ii) The current that flows through the transmission cables (2 marks)

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(iii) The voltage drop across the transmission cables (2 marks)

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(iv) The power loss during transmission (2 marks)

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(v) The power that reaches the sub-station (2 marks)

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b) An immersion heater is rated 950W 250V. It is used for 2 hours daily. If electricity cost sh12.00 per unit, calculate the weekly cost of running the heater. (1 mark)

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14a) Explain how doping produces a p-type semi conductor for pure semi conductor material (2 marks)

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(i) Explain using a diagram how diodes can be used in a full-wave rectification (4 marks)

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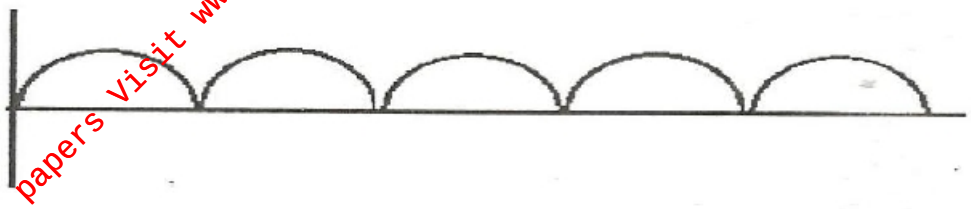
(ii) Figure 7 shows the output of a wave from an a.c source



Using a circuit show how the above output is produced. (3 marks)

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d) Name two ways of enhancing the conductivity of a semiconductor (2 marks)

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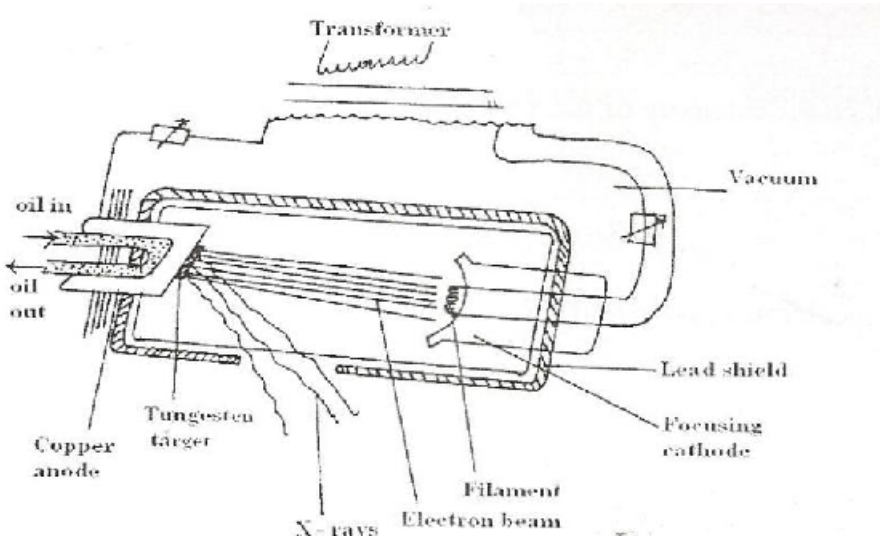
15. The figure below shows the essential component of a X-ray tube.



(i) Explain how X-ray are produced. (2 marks)

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(ii) Why is the target made of tungsten? (1 mark)

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(iii) Why would it be necessary for the target to rotate during operation of this machine? (1 mark)

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(iv) What adjustment on the x-ray tube will:

I. Increase the hardness of the x-rays (1 mark)

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II. Reduce the intensity of the x-rays. (1m ark)

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(v) An x-ray tube has an accelerating p.d of 50 kV. Determine the shortest wavelength of in its x-ray beam. (3 marks)

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