NAME OF THE SCHOOL ……

CANDIDATES' NAME…… INDEX NO. ……

CANDIDATES' SIGNATURE…… DATE……

NAKURU DISTRICT SECONDARY SCHOOLS TRIAL EXAMINATION 2014

Kenya Certificate of Secondary Education

232 - PHYSICS PAPER 2

JULY/AUGUST 2014

TIME:

INSTRUCTIONS:

*This paper consists of two sections **A** and **B**.*

*Answer all questions from **both** sections in the spaces provided.*

*All working **must** be clearly shown. Electronic calculator may be used.*

FOR EXAMINER'S USE ONLY

SECTION	QUESTION	MAX SCORE	CANDIDATE'S SCORE
A	1 – 12	25	
B	13	11	
	14	7	
	15	12	
	16	11	
	17	13	
	TOTAL	80	

SECTION A (25 MARKS)

1. **Figure1** shows two plane mirrors inclined at an angle x from each other.

A viewer counts a total of seven images by looking directly from the object **O**. Determine the value of **x**. (2mks)

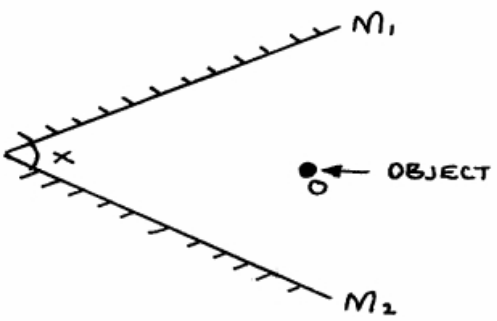


Figure 1

2. **Figure 2** shows two spherical materials one an insulator while the other a conductor. Negative charges are introduced at point A by contact method in each case.

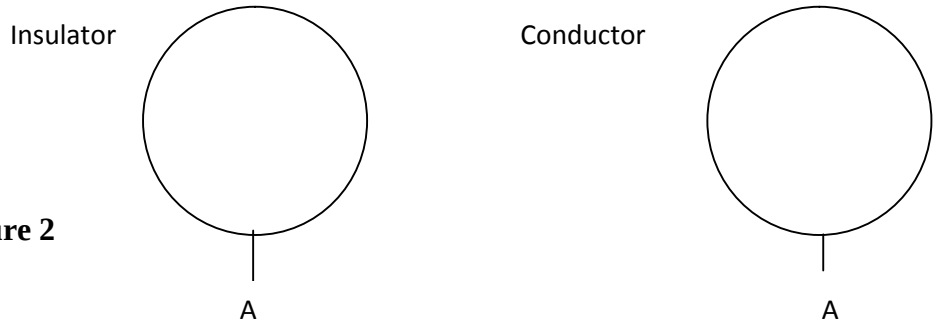


Figure 2

On the same figure indicate the final position of the charges. Explain your answer. (2mks)

3. Two capacitors of capacitance 2μF and 1μF are connected in parallel. A potential difference of 3V is applied across them. Find the energy stored in the combination (3mks)

4. A girl shouts and hears an echo after 0.6 second later from a cliff. If velocity of sound is 330m/s. calculate the distance between her and the cliff.
(3mks)

5. In the circuit diagram shown in **figure 3**, the lamps are identical and cells are also identical.

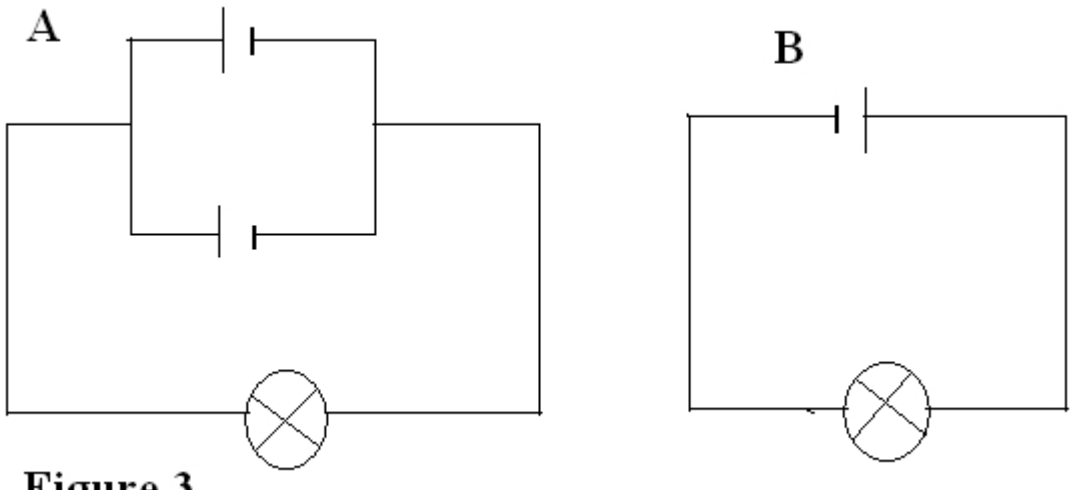


Figure 3

State with reason, in which circuit the lamp will be lit for a longer period. (2mks)

6. **Figure 4** shows how rays from a distant and near object are focused inside a human eye with a certain defect.

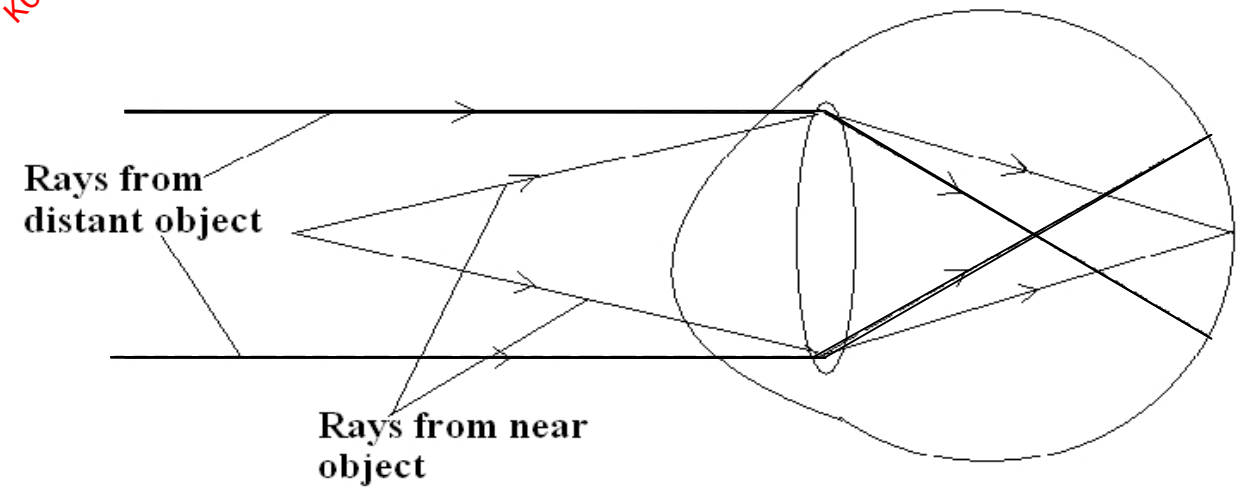


Figure 4

Name the defect and state the cause of this defect (2mk)

7. Two pins are hanging from a magnet as shown in the **figure 5**

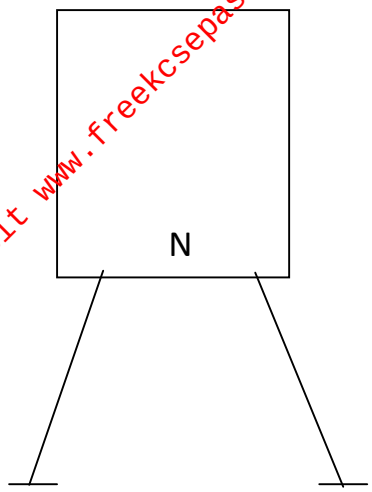


Figure 5

Explain why the pins do not hang vertically downwards (1mk)

8. State the necessary conditions for stationary waves to be generated (2mks)

9. The speed of yellow light in the prism is 1.88×10^8m/s. Determine the refractive index of the glass prism material. (Speed of light in vacuum C= 3.0×10^8m/s) 2mks)

10. A 2.5 kW immersion heater is used to heat water. Calculate the operating voltage at the heater if its resistance is 24Ω (3mks)

11. Arrange the following in order of increasing frequency

Visible light, x-rays, Infra-red radiation, UV light, Radio waves (1mk)

12. Distinguish between a fuse and the earth wire (2mks)

SECTION B (55 MARKS)

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

(b) An electrician installed electric wiring in a house and connected the bulbs and the switches as shown in **figure 6.**

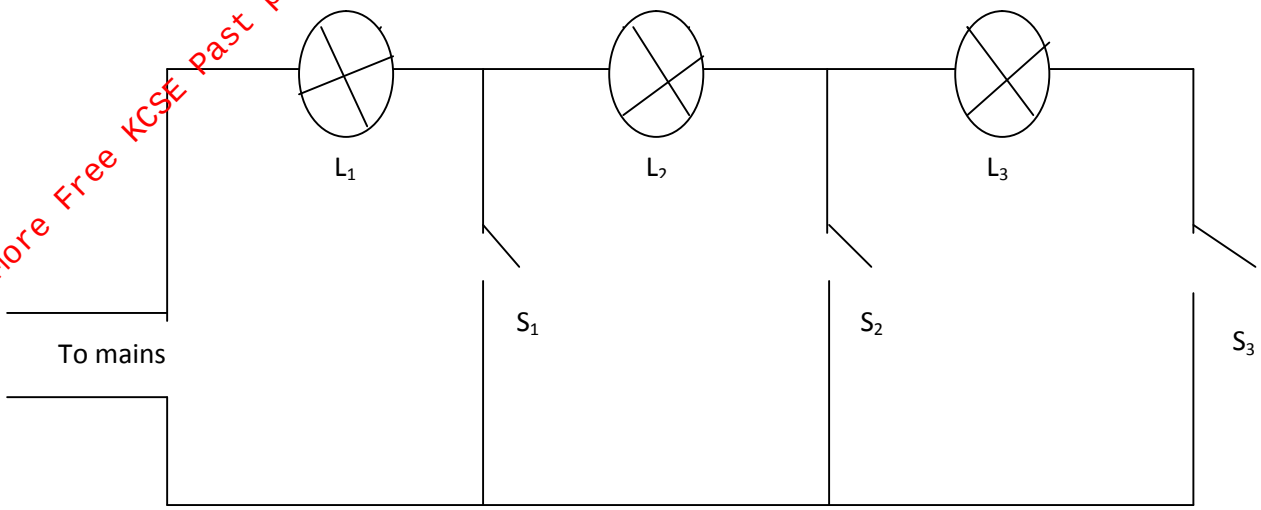


Figure 6

State what happens when switch;

(i) S_1 only is closed (1mk)

(ii) S_1 and S_3 only are closed (1mk)

(iii) All the switches are closed. Explain your answer (2mks)

(b) Figure 7 shows a circuit

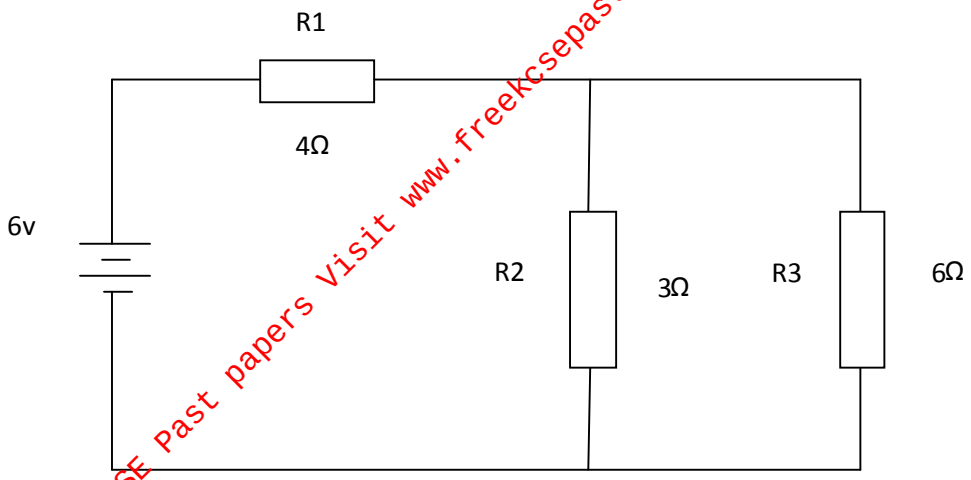


Figure 7

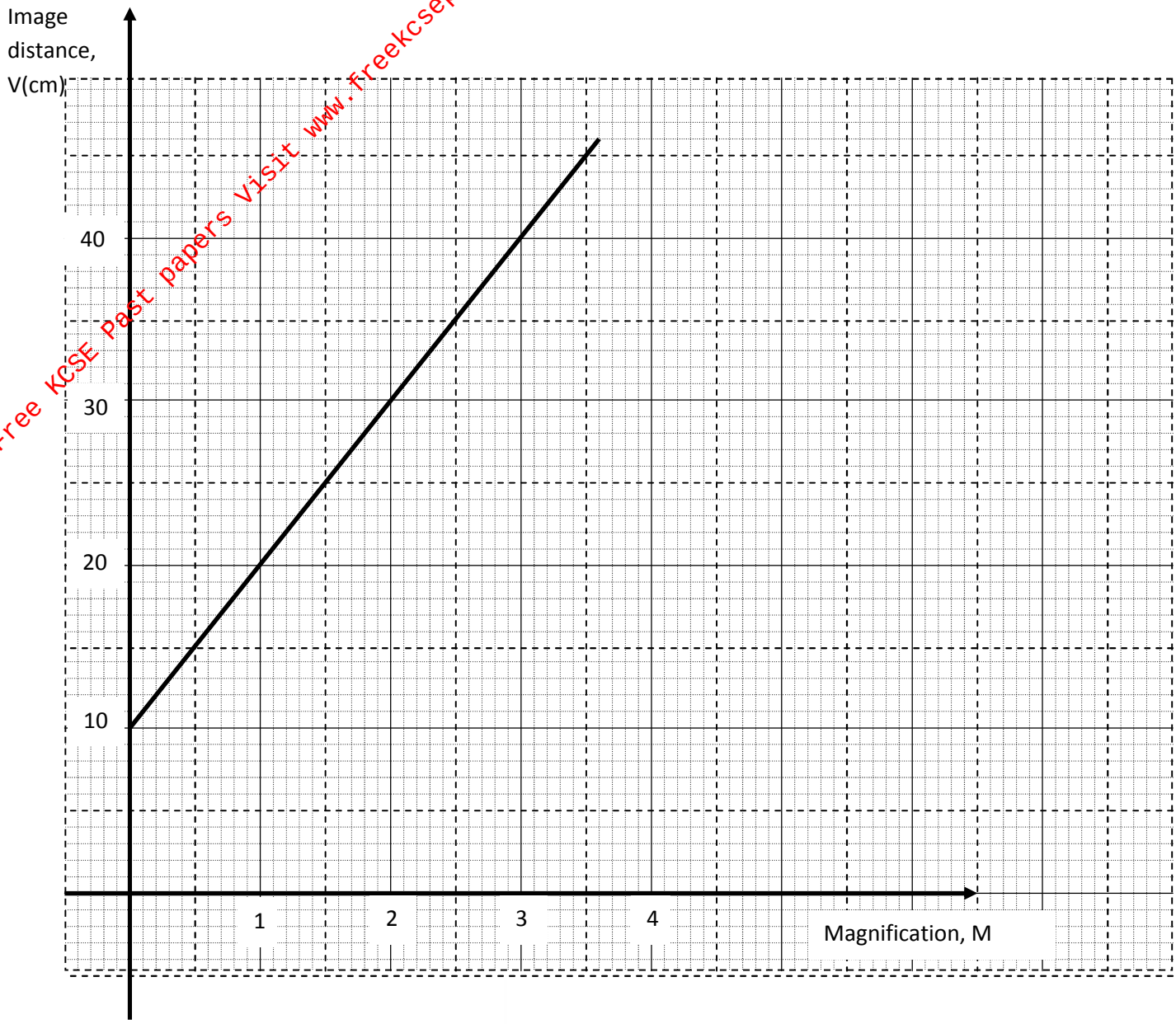
Calculate

(i) The total resistance of the circuit (2mk)

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

(iii) The voltage drop across R_1 (2mk)

14. The following graph shows the variation of image distance, V, with magnification, M, for a converging lens.



Using the graph and the equation $\frac{V}{f} = M + 1$ to determine:

(i) The object position when the image position is 45cm (3 marks)

(ii) The focal length of the lens (2 marks)

(iii) The power of the lens. (2 marks)

15. (a) (i) State one cause of energy losses in a transformer and explain how it can be minimized. (2mks)

(ii) Describe briefly the energy changes involved in the generation of electrical energy at a hydropower station (2mks)

(iii) What are the advantages of transmitting power at:

(I) Very high voltages (1mk)

(II) Alternating voltage (1mk)

(b)(i) Explain how electrons are produced in a cathode ray oscilloscope (CRO) (2 mk

(ii) State two functions of the anodes in a CRO. (2mks)

(iii) At what part of the cathode ray oscilloscope would the time base be connected (1mk)

(iv) State why the tube is highly evacuated (1mk)

16. (a)(i) An x-ray tube is operating with an anode potential of 50kV. Calculate: the maximum speed of an electron(Charge of an electron is $1.6x10^{-19}$ C mass of an electron is $9.1x10^{-31}$kg) (3mks)

(ii) A faulty X-ray tube generates X-rays of higher intensity than required. State what adjustment should be made to correct the defect. (1mk)

(iv) Distinguish between hard and soft X-rays (2mk)

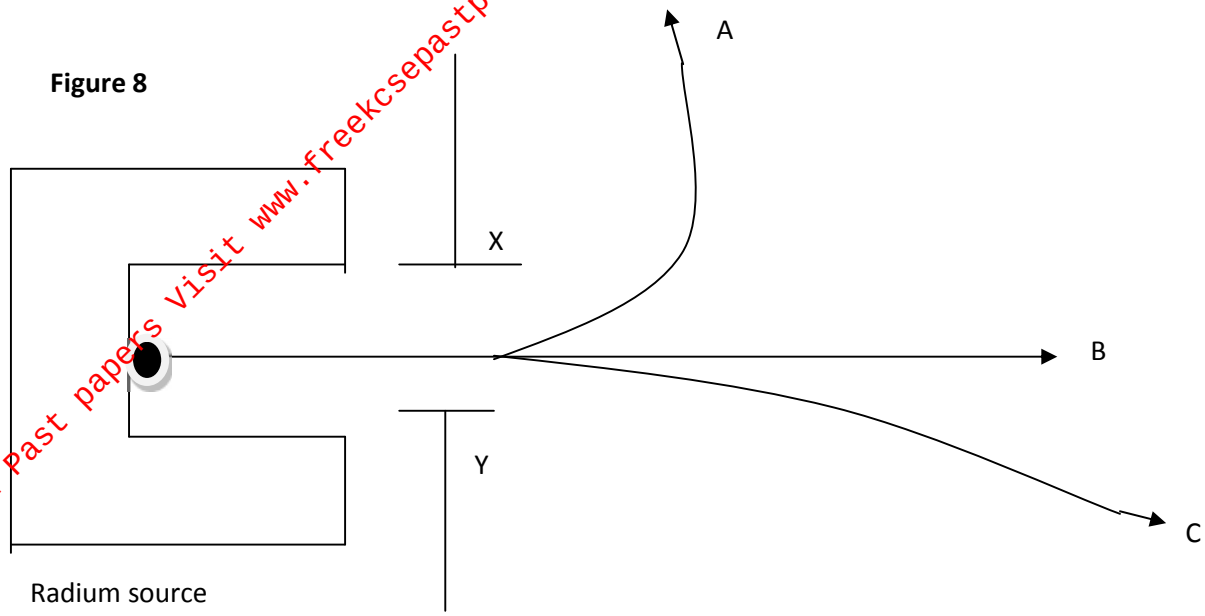
(v) Explain the effect of exposing a patient to X-rays for too long (1mk)

(b)(i)What is meant by the term work function? (2mk)

ii) The work function of a certain material is 3.2eV. Determine the threshold frequency for the material. (1 electron Volt (eV) = 1.6×10^{-19}J and planks constant= 6.62×10^{-34}Js) (3mks)

17.(a)Study **figure 8** and answer the following questions

Figure 8



i) State the charge on plate X (1mk)

ii) Identify the radiation A and B

A---------- (1mk)

B---------- (1mk)

iii) A nuclear reaction is represented by the following equation

$$^{a}_{92}x \rightarrow {}^{234}_{b}Y + Alpha\ particle$$

Determine the values of **a** and **b** (2mks)

(vi) A radioactive source has an activity of 810 c/s and after 63hours the count rate falls to 110c/s. If the background count is 10c/s, determine the half-life of the source (3mks)

(b) (i) Draw using appropriate symbols the circuit diagram of a junction diode in reverse bias (1mk)

ii) Extrinsic semiconductors are made through a process called doping. Explain how doping produces an n-type semi-conductor (2mks)

iii) Distinguish between a semiconductor and a conductors (2mks)