NAME:……..INDEX……...…DATE……...…

SCHOOL:……..…SIGNATURE……

232/2
PHYSICS
PAPER2
JULY / AUGUST, 2010
2 HOURS

JOINT INTER-SCHOOLS EVALUATION TEST (JISET)
Kenya Certificate of Secondary Education 2010

232/2
PHYSICS
PAPER2
JULY / AUGUST 2010

INSTRUCTIONS TO CANDIDATES

- *Write your name and index number in the spaces provided above*
- *Sign and write the date of the examination in the spaces provided*
- *Attempt **ALL** questions in sections A and B.*
- *All your answers must be written in the spaces provided in this question paper.*
- *All working must be clearly shown*
- *Non programmable silent electronic calculators and KNEC mathematics table may be used except where stated otherwise*

For Examiner's Use Only

Section	Question	Maximum Score	Candidates' Score
A	Q1 – Q15	25	
B	Q16	15	
	Q17	12	
	Q18	12	
	Q19	15	
		80	

SECTION A (25 MARKS)

1. Explain what you understand by the term critical angle as applied in optics (1 mk)

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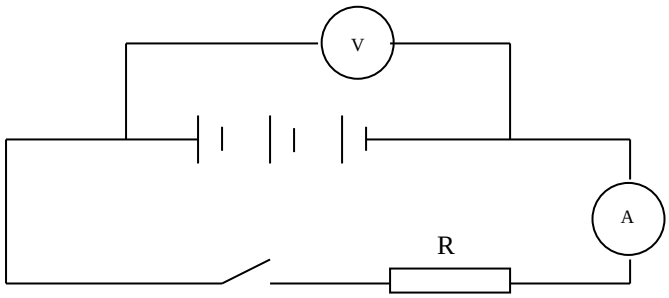
   It was noted that for the circuit diagram below, when the switch is open, the voltmeter gives a reading of 12V, but when the switch is closed the voltmeter drops to 10V.

   Fig 1



   Use the information to answer questions 2, 3 and 4

2. Give an explanation for the difference in reading on the voltmeter when the switch is open and when it is closed. (2 mks)

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3. If the ammeter gives a reading of 0.8A when the switch is closed, determine the value of R. (1 mk)

4. Determine the internal resistance of the accumulator (2 mks)

5. Other than temperature state the other factors that affect the resistance of an ohmic conductor. (1 mk)

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6. Define the term photoelectric effect (1 mk)

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7. Explain the meaning of 'donor' and 'acceptor' atoms in relation to semi conductors. (2 mks)

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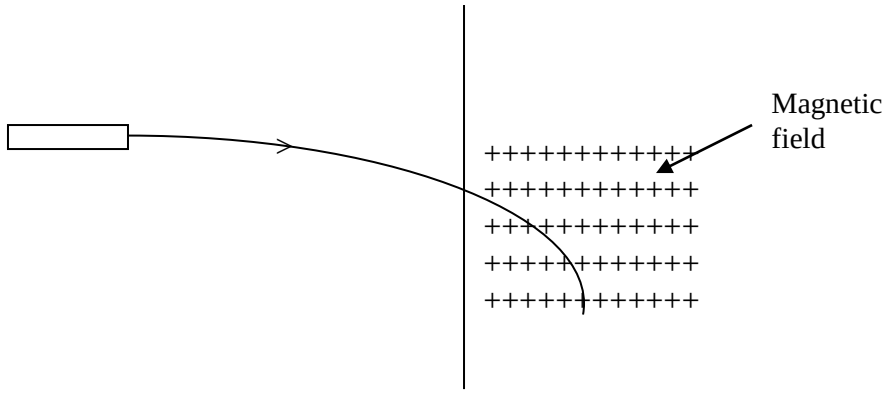
The figure 2 below shows the path of radiation from a radioactive source after entering a magnetic field. The magnetic field is directed into the paper and is perpendicular to the plane of the paper as shown.

Fig 2



Use the information to answer question 8 and 9

8. Identify the radiation (1 mk)

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9. Give a reason for your answer (1 mk)

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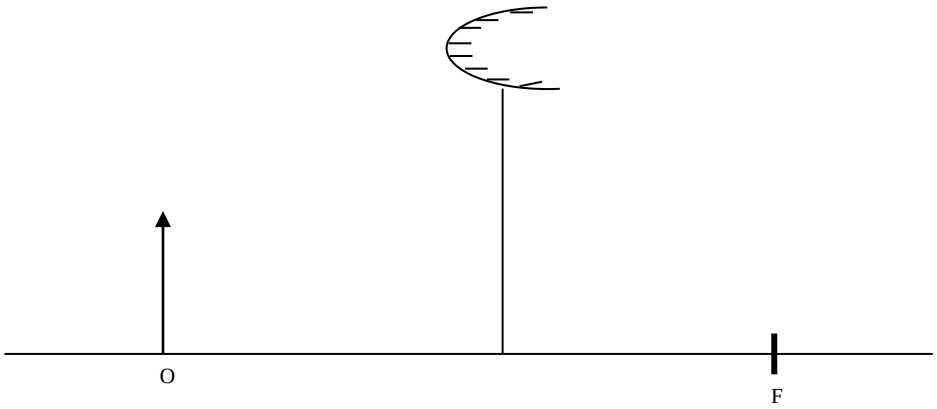
10. The audible frequency range for a certain person is 30Hz to 16500Hz. Determine the largest wavelength of sound in air the person can detect. Speed of sound 340m/s (3 mks)

11. The figure 3 below represents an object O placed 5cm in front of a convex mirror. F is the focal point of the mirror.

Fig 3



Draw rays to locate the position of the image. Determine the image distance (2 mks)

12. State the factor that determines the hardness of the X-rays produced in an X-ray tube (1 mk)

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13. State the necessary conditions for stationary waves to be generated (2 mk)

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14. Under what conditions does a converging lens form

(i) Real images (1 mk)

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(ii) Virtual images (1 mk)

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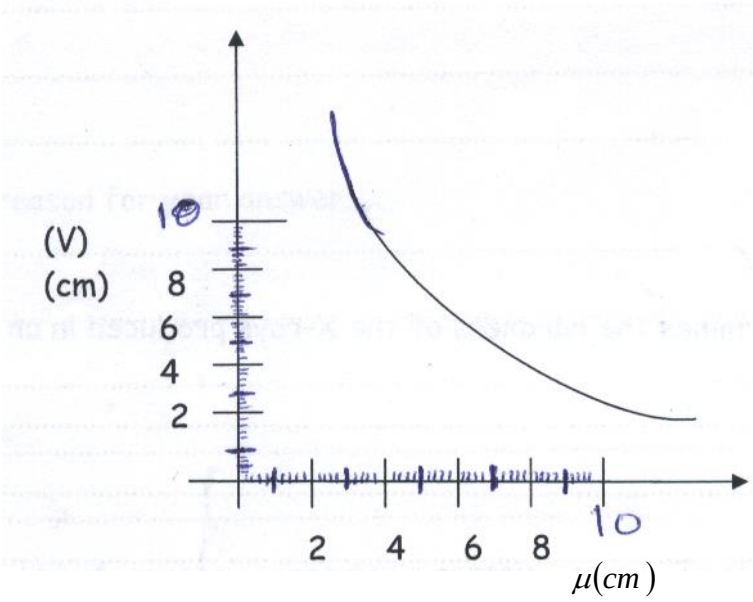
15. The graph below is a plot of image distance against the object for a concave lens

Fig 4



From the graph determine the focal length of the concave lens. (3 mks)

SECTION B (55 MARKS)

16. a) A person standing behind a wall hears a bell ringing although he cannot see the bell. What property of sound enables him to hear the sound? (1 mk)

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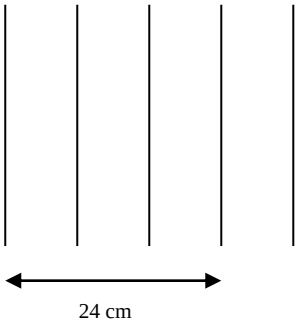
b) The figure below is a sketch of ripples caused by a vibrator in a ripple tank whose frequency is 50Hz



Using the above information, determine the speed of the wave motion.(3 mks)

c) The speed of sound in air determined on a warm day is 330m/s. Explain any difference you would expect in the results if the measurement is done on a cold day. (2 mks)

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d) In an experiment to determine the speed of a sound, an observer stood in front of a high wall at a distance of 80m. He clapped two boards together at such a rate that each clap coincided with the echo from the wall. A second observer noted a time of 9.5 seconds starting with the first clap and ending with the 21st clap.

i. Calculate the speed of sound under these conditions (3 mks)

ii. Describe **one** probable source of error in this experiment. (1 mk)

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e)

(i) State **four** properties of sound waves which are similar to those of light waves (4 mks)

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(ii) State **one** way in which sound waves differ from light waves (1 mk)

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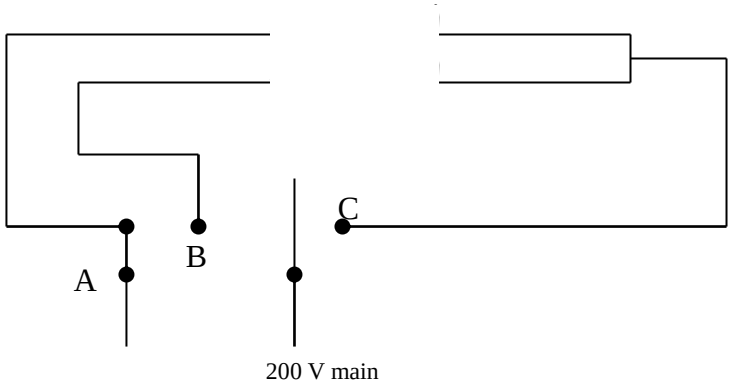
17. Figure 6 below shows the arrangement of elements in a circuit of an electric cooker. The two elements P and Q are each of resistance 40 ohms. One side of the mains is connected to terminals A. The other side of the mains is connected to a selector with three positions.

Fig 6



i) In the first position of the switch, the mains are connected to terminal C and terminals A. Through which element does the current flow? (1 mk)

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ii) Determine the magnitude of the current through the element (2 mks)

iii) In the second position of the switch the mains are connected to terminal B and to terminal A. Calculate the total resistance in the circuit. (2 mks)

iv) Determine the magnitude of current in the second connection. (3 mks)

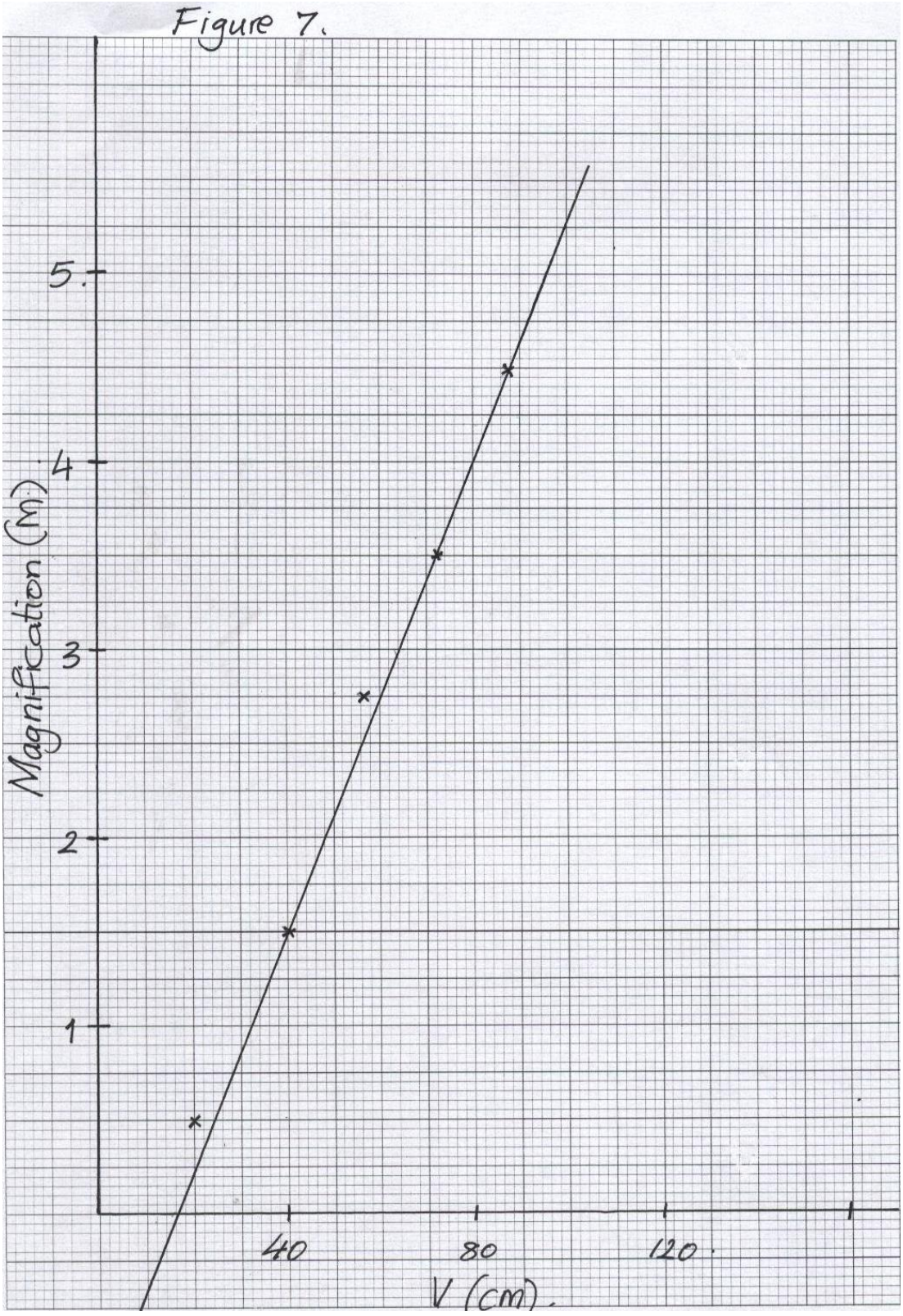
v) In the third connection of the switch, terminal B is connected to terminal A and then to one side of the mains while the other side of the mains is connected to terminal C.

(i) . Determine the total resistance in the circuit (3 mks)

(ii) . Determine the magnitude of the power consumed by this connection. (2 mks)

18. The graph in figure 7below shows the relationship between magnifications of the image against image distance of a concave mirror. Use the formation on the graph to answer questions that follow

Fig 7



a) Given that the mirror formula is $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$, write down the equation of the graph. (3 mks)

b) Determine the object distance when m =1.0 (2 mks)

c) Determine the focal length of the mirror (3 mks)

d) The distance between an object and its magnified real image produced by a concave mirror is 20cm. When the object is placed 10cm from the pole of the mirror.

Determine

i) Linear magnification of the image (3 mks)

ii) The focal length of the mirror (3 mks)

19. a) (i) With a well labelled diagram shows how a junction diode is formed (2 mks)

(ii) Explain why a junction diode only conducts in one way (2 mks)

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b) (i) State what is meant by breakdown voltage for a diode (1 mk)

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(ii) Name **two** applications of a junction diode (2 mks)

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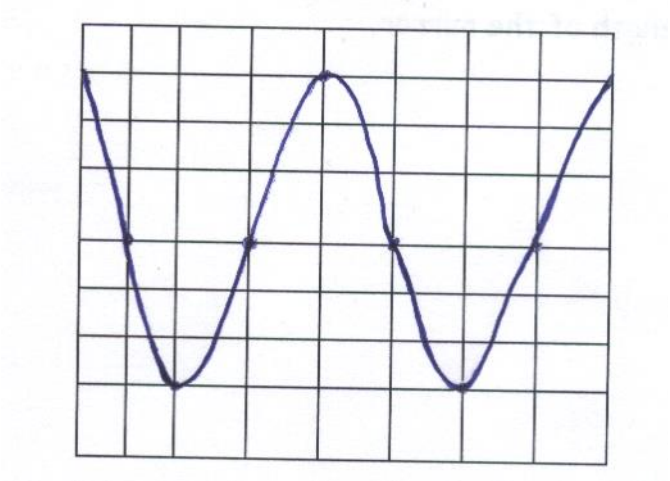
c) The figure 8 below shows the trace on the screen of an a.c signal connected to the y-plates of C.R.O with time base on.



Given that the time control is 5ms/div, and the y-again is at 100V/div, determine:

i) The frequency of the a.c signal. (2 mks)

ii) The peak voltage of the input signal (3 mks)

d) State the importance of the magnetic coils in a television tube (1 mk)

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