NAME:……..……INDEX NO:……

SCHOOL:……

Candidates Signature: ……

Date: ……

232 / 2
PHYSICS
PAPER 2
JULY / AUGUST 2014
2 HOURS

MMS JOINT EXAMINATION - 2014

Kenya Certificate Of Secondary Education

232 / 2
PHYSICS
PAPER 2

INSTRUCTIONS TO CANDIDATES

- *Write your name and index number in number in the spaces provided above.*
- *Sign and write the date of examination in the spaces provided.*
- *This paper consists of TWO sections A and B*
- *Answer ALL the questions in Section A and B in the spaces provided.*
- *All working must be clearly shown in the spaces provided in this booklet.*
- *None programmable silent electronic calculators and KNEC Mathematical tables may e used except where stated otherwise.*

FOR EXAMINER'S USE ONLY

Section	Question	Maximum Score	Candidate's Score
A	1 – 13	25	
	14	15	
	15	15	
	16	13	
	17	12	
		80	

This paper consists of 12 printed pages. Candidates should check the question paper to ensure that all the pages are printed as indicates and no questions are missing.

SECTION A (25 MARKS)

Answer all questions in this section in the spaces provided.

1. An object O is placed near a plane mirror as shown in **fig. 1** below

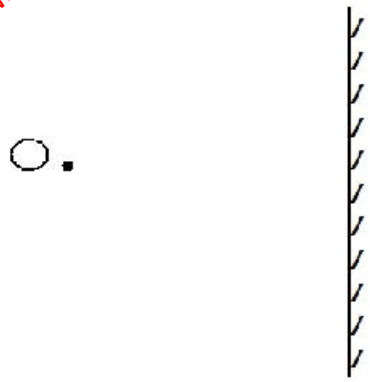


Figure 1

Using two rays **complete** the diagram showing the position of the image. (2mks)

2. **Explain** with an aid of a diagram why to a diver under water, most of the surface looks slivery. Bubbles of air rising from the diver look slivery. (2mks)

3. **State** the type of electromagnetic spectrum emitted by warm objects. (1mk)

……

……

……

4. A soldier standing between 2 cliffs fires a gun. He hears the first echo after 2s and the next after 5s. **Determine** the distance, between the two cliffs (3mks)

(Take speed of sound as 340 m/s.)

……

……

……

5. **Explain** why soft iron keepers are suitable for storing magnets (2mks)

……

……

……

6. **Fig. 2** below shows a conductor carrying current placed in the magnetic field of two magnets. **Complete** the diagram by showing the field pattern and the direction of force F that acts on the conductor. (2mks)

Figure 2

7. You are provided with a polythene rod, an Electroscope, two bars; one a conductor and another one an insulator. **Briefly describe** how you will use the electroscope to determine which one is an insulator. (3mks)

……

……

……

……

8. **State two** quantities that are used to determine whether accumulator require recharging or not. (2mks)

……

……

……

9. **Complete** the table by stating the different types of electromagnetic radiations. (3mks)

Type of radiation	Use
	Sending information to and from satellites
	Emitted by a remote control unit
	Producing shadow pictures of bones

10. **State any one** safety feature present in modern mains plug. (1mk)

……

……

11. **Draw** a circuit diagram to show how you would use a voltmeter, ammeter, variable resistor and connecting wires to find the resistance of a lamp. (1mk)

12. **State** the Flemings left hand rule. (1mk)

……

……

13. A time- base is adjusted so that it draws a horizontal line as shown, 50 times per second.

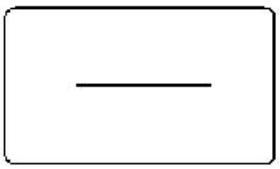


Figure 3

Draw a diagram of what is seen when the following are connected.

(a) A battery which makes the upper y- plate positive. (1mk)

(b) an a.c supply of 50Hz. (1mk)

SECTION B (55 MARKS)

Answer all questions in the spaces provided after each question.

15 (a) A student hung a magnet next to coil of wire to make a door chime as shown in fig. 4

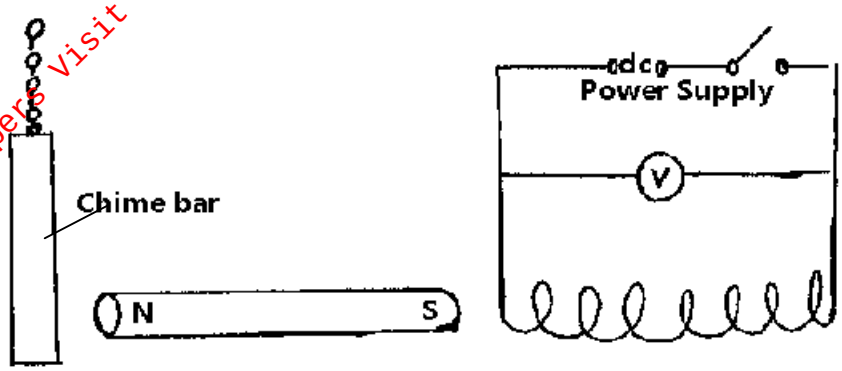


Figure 4

When the current was switched on the magnet hit the chime bar which made a noise.

(i) **Explain** how the current made the magnet move towards the chime bar. (2mks)

……

……

……

(ii) The student wanted the magnet to hit the chime bar harder, **suggest two** changes that would make it happen. (2mks)

……

……

(iii) The student was told to describe the energy transfers inside the device. **Give two** changes that will happen to the energy as the current flows through the coil. (2mks)

……

……

(b) A coil of wire is connected in series with a battery a rheostat and a switch as shown in figure 5.

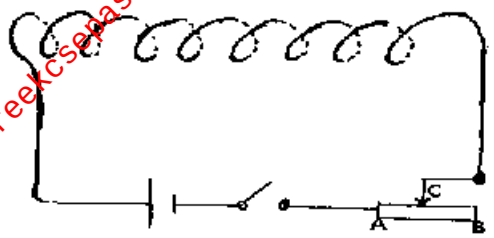


Figure 5

(i) **Draw**, on the diagram, the shape of the magnetic field inside and outside the coil when the switch is closed. (2mks)

If the slider, C on the rheostat is moved towards B, **What** is the effect on:

(ii) the resistance of the circuit (1mk)

……

……

(iii) The current through the coil (1mk)

……

……

(iv) The magnetic field in the coil. (1mk)

……

……

(c) i) **Explain** why a transformer will only transform alternating voltages not dc voltages. (2mks)

……

……

(ii) **Explain** why transformers are widely used throughout the national grid (2mks)

……

……

16 a) Three radioactive substances have to be stored safely. Details of the substances are given below.

Substance	Half life	Type of radiation given out
A	5000 years	Alpha ($\propto$)
B	4 years	Beta (β)
C	156 years	Gamma (γ) Alpha ($\propto$)

Which of the following containers would you use for each substance.

(i) Aluminium (ii) Thin plastic (iii) lead lined (3mks)

A: .....

B: .....

C: .....

Give a **reason** to your answer to part (iii) (1mk)

……

……

……

(b) **Copy and complete** the table below for substance B (2mks)

Date	Mass of original radioactive substance left.
1 March 1992	8 Kg
1 March 1996	
1 March 2004	

(c) A Geiger counter was used to measure the activity (In count per minute) from a radioactive sample in the laboratory over a period of years. Over this period the background radiation was regularly measured at 4 counts/minute.

The table of results is shown below.

Time in years	0	1	2	3	4	5	6
Recorded activity in counts/min	124	80	52	34	23	16	12
Activity due to sample alone							

(i) **Complete** the table by giving the activity of the sample alone. (1mk)

(ii) **Explain** what is meant by background radiations. (1mk)

……

……

(iii) On the grid provided plot a graph of activity of the sample alone against time. (4mks)

Grid

(iv) **Find** the half life of the substance from your graph. (1mk)

……

……

(d) While animals or plants are living, the proportion of $^{14}_{6}C$ in them remain constant but once they die, the carbon 14 decays. Suppose a modern born contains 80 units of C – 14, and an old born contains just 10 units. **How** old is the bone? (2mks)

(Take the half life of carbon – 14 to be 5700 years).

……

……

……

……

……

17. (a) A vibrating source S produces circular water waves near, a straight reflector as shown in **fig. 6**.

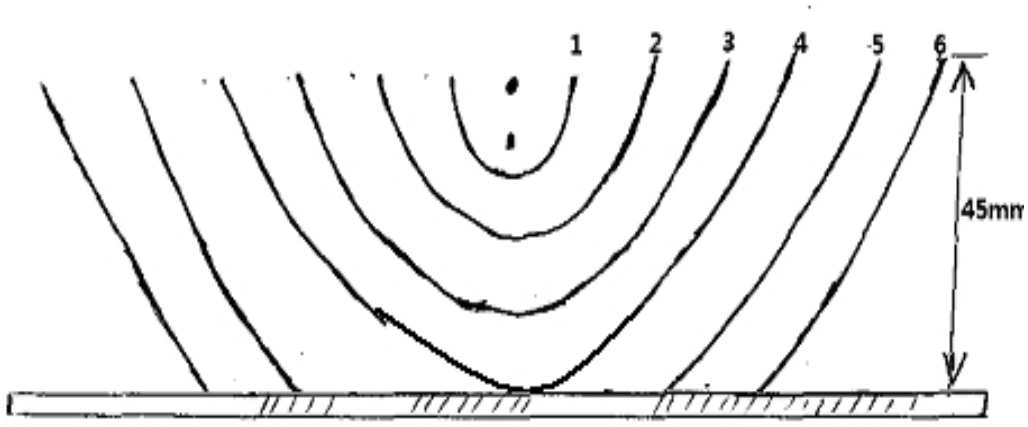


Figure 6

(i) **Copy and complete** the diagram to show how crest 5 and 6 are reflected (1mk)

(ii) From the figure **determine** the wavelength of the water waves. (1mk)

……

……

(iii) **Find** the frequency of the waves if their speed is 60mm/s. (2mks)

……

……

(b) The figure below show a simple diagram of an eye as shown in **fig. 7**.

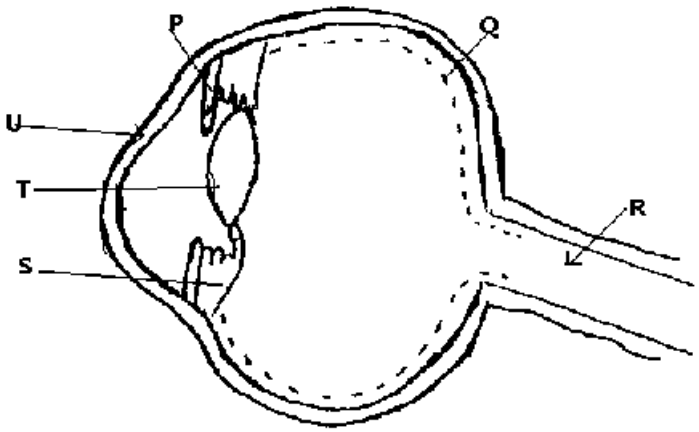


Figure 7

(i) **Identify** the following parts of the eye by indicating the letter against them.

The cornea:.....

The Retina:.....

(2mks)

(ii) A person enters a brightly lit room from a dark corridor.

I. **State** the effect on the pupil of the eye. (1mk)

……

……

II. **How** does this affect the amount of light entering the eye? (1mk)

……

……

……

(iii) **Copy and complete** the table below

Part of the eye	Description
	Sensitive to light

	Carries to light
	Alters the size of the pupil

(3mks)

(iv) A normal eye is able to produce sharp images of objects at different distances.
Describe and explain how it does this (2mks)

……
……
……

17. (a) A car battery is used to light a 12V lamp A constant current of 3 A passes round the circuit.

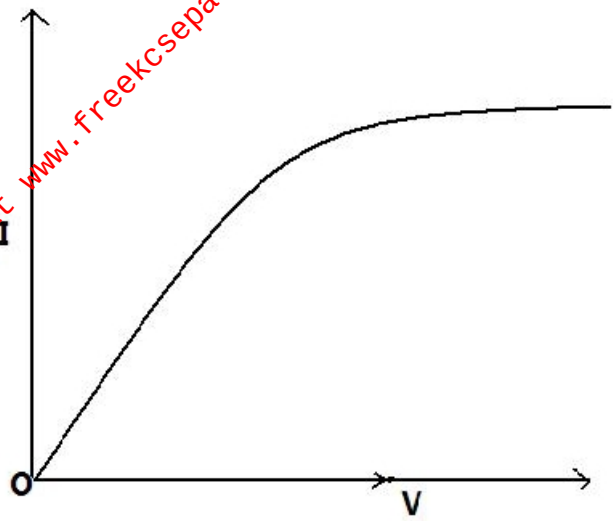
(i) **Explain** what happens to the energy of the electron as they flow through the lamp wire.
(3mks)

……
……
……
……

(ii) **How** much energy is transferred by the lamp in 20 seconds? (2mks)

……
……
……

(b) For a particular specimen of wire, a series of readings of the current through the wire for different potential differences across it is taken and plotted as shown.



(i) **Explain** how the resistance of the wire changes (3mks)

……

……

……

(iii) **How** would the resistance of a piece of wire change if

(I) the length were doubled (2mks)

……

……

……

(II) the diameter were doubled (2mks)

……

……

……