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NAME:……..……INDEX NO:……

SCHOOL:……..…….

Candidate's Signature: …….

Date: …….

232 / 2

PHYSICS
PAPER 2 (Theory)
JULY / AUGUST 2010
2 HOURS

KAKAMEGA NORTH DISTRICT JOINT EVALUATION TESTS

Kenya Certificate of Secondary Education (K.C.S.E) 2010

232 / 2
PHYSICS
PAPER 2

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*
- *This paper consists of two sections, A and B.*
- *Answer **all** the questions in the spaces provided*
- *All working must be clearly shown*
- *Non programmable silent electronic calculators and KNEC Mathematical tables **may** be used except where stated otherwise.*

For Examiners Use Only

Section	Question	Maximum Score	Candidates' Score
A	1 – 14	25	
B	15 16 17 18 19	13 15 08 10 09	
	Total Score	80	

SECTION A (25MARKS)

1. Figure 1 shows circular waves approaching a straight reflector. **Complete** the sketch to show what happens when the waves hit the reflector (1mk)

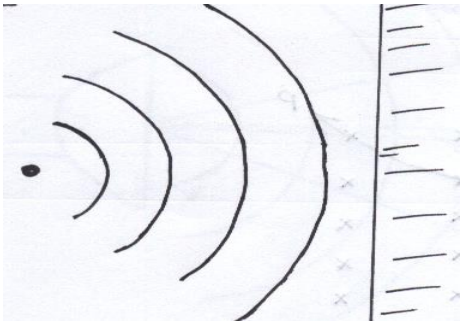

Figure 1

2. **State one** property that is common to all members of the electromagnetic spectrum. (1mk)

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3. Figures 2 below shows part of a ring main circuit connected to the hair drier in a salon

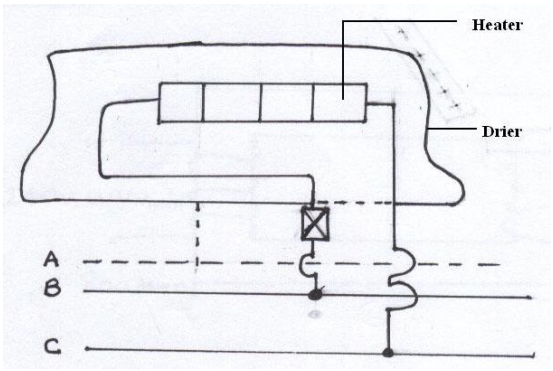

Figure 2

Identify the parts

A: ……

B: ……

C: ……

4. The longest wavelength of radiation that can produce photoelectric effect in iron is $2.67x10^{-7}$m.calculate the work function of iron. Take speed of light =$3.0x10^{8}$ m\s; Plank's constant h=$6.63x10^{-34}$ Js (3mks)

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5. Figure 3 below shows a source radiations .The radiations enter a uniform magnetic field as shown

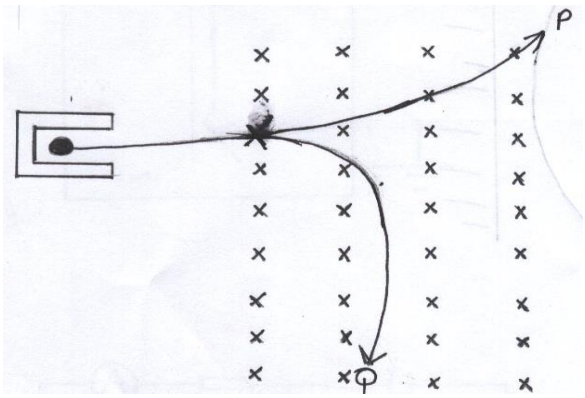

Figure 3

(i) **Identify** the radiation

P: ……..……..

Q: ……

(2mks)

(ii) **Give two** reasons for each of the radiations you have identified in 5(i) (2mks)

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6. **State one** way through which the electrical conductivity of a semi-conductor can be increased (1mk)

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7. **Draw** a simple diagram to show a p-n junction forward biased (1mk)

8. A real image, half the size of the object is formed by a lens. If the distance between the objects and the image is 450mm. **Determine** the focal length of the objects. (3mks)

9. Figure 4 below shows two parallel current carrying conductors A and B placed close to one another. Current flows in the opposite directions.

Figure 4

(i) Sketch the magnetic field pattern formed by the two conductors. (1mk)

(ii) Indicate the force F, due to the current on each conductor (1mk)

10. A small object lies at the bottom of a water pond at a depth of 2.4m.Given that the refractive index of water is 1.3, **determine** the apparent depth of the object. Give your answer to 1 decimal place. (2mks)

11. **State** the function of the control grid of the cathode ray oscilloscope and state how it is achieved. (2mks)

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12. **State one** difference between mechanical and electromagnetic waves. (1mk)

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13. Figures 5 shows a charged rod held close to the cap of an uncharged electroscope

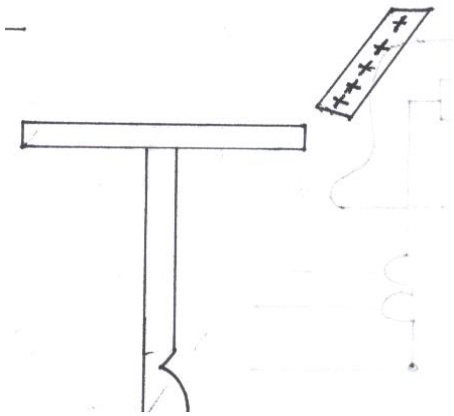

Figure 5

If the cap is momentarily earthed before removing the charged rod, what charge is left on the electroscope? (1mk)

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14. A capacitor of capacitance 10μf is charged by a battery to 5v.How much charge is stored in each plate (2mks)

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SECTION B (55MARKS)

15. (a) A Girl stands some distance from a high wall and claps her hands

(i) What two measurements would need to be made in order to determine the speed of sound? (2mks)

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(ii) **Describe** how you would make use of these measurements (3mks)

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(iii) The speed of sound in air is 330m\s.How far from the wall would you stand? Choose an answer from the following distances .10m, 200m, 500m.
Give reasons why you did not choose each of the other two distances (2mks)

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(b) The balloon filled with carbon dioxide can act like a lens and focus sound from a loud speaker. On to the microphone, Figure 6 show waves produced by loud speaker moving towards the balloon.

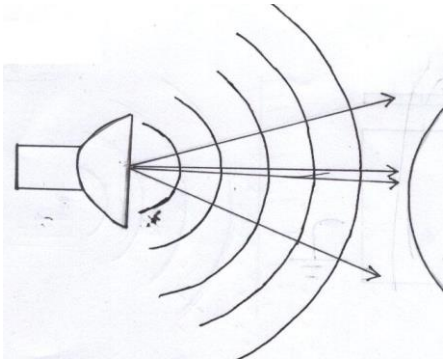

Figure 6

(i) **Complete** the diagram to show what happens to the sound waves when they happens to the sound waves when they have passed through the balloon and moves towards the microphone (2mks)

(ii) The loud speaker is now moved towards the balloon .This results in less sound at the microphone. **Explain** why there is less sound at the microphone. (1mk)

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(iii) The frequency of the sound emitted by the loud speaker is 1020Hz. **Calculate** the wavelength of the sound wave in air where its velocity is 340m\s (2mks)

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

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(b)What are the advantages of transmitting power at

(i) Very high voltages

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(ii) Alternating voltage

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(c) A 6v, 24w lamp shines at full brightness when it is connected to the output of this main transformer as shown in the figure 7

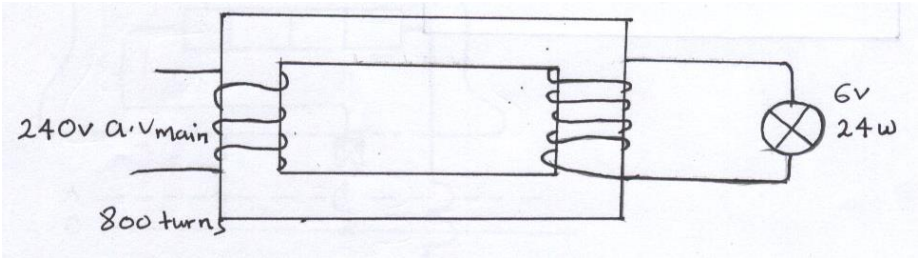

Figure 7

Assuming the transformer is 100% efficient, **calculate**

(i) The number of turns in the secondary coil if the lamp is to work at its normal brightness (2mks)

(ii) The current which flows in the main cables. (2mks)

(d) **Explain** whether and how the number of secondary turns of the transformer shown in figure 7 should be altered if

i) Two 6v lamps in series are to work at normal brightness (2mks)

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ii) Two 6v lamps in parallel are to work at normal brightness (1mk)

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(e) Figures 8 shows a generator of electricity

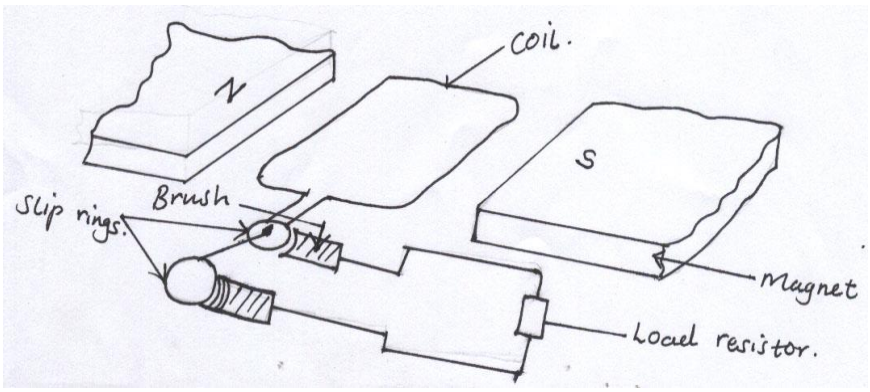

Figure 8

The coil rotates at a steady speed of 60 turns rotations per minute. An oscilloscope is connected a cross the load and adjusted to get on the screen a trace for one rotation of the coil. Sketch the trace for one rotation starting and finishing in the same position of the coil as shown in the figure 8 (3mks)

17. Two students investigated how the strength of an electromagnet depended on the current .The set up is as shown in the figure 9

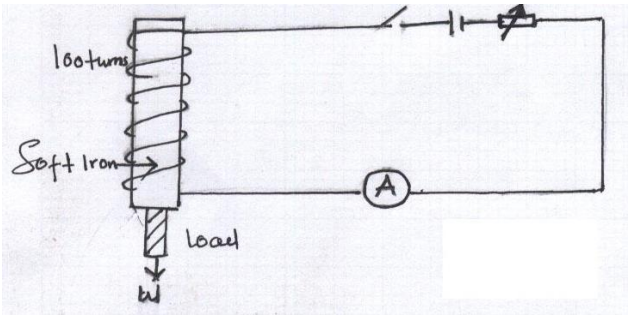

Figure 9

They plotted the following graph showing how the load varies with the magnetizing current in figure 10

Picture GRAPH

a) From the graph determine the load that can be supported by the electromagnet if the current was

(i) 2.75A (2mks)

(ii) 6.0A (2mks)

b) **Sketch** on the same axis a graph you would expect if coil of 50 turns was used (1mk)

c) (i) Using the domain theory **explain** what happens to the iron (2mks)

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(ii) **State** the reason for graph levelling off at the top

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18. (a) Figure 11 shows a charged leaf electroscope

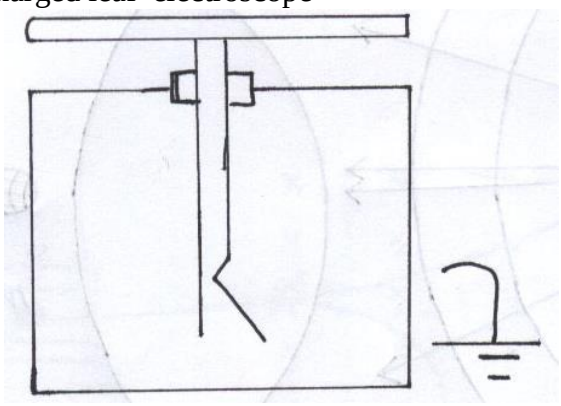

Figure 11

Given a dry glass rod and a silk cloth, **explain** how you would determine the type of charge on the electroscope (3mks)

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(b) An identical but uncharged electroscope is brought near the electroscope shown in the figure11 and the two connected with a conducting wire. **State** and **explain** what is observed on the leaves of the two electroscopes (2mks)

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(c) **Explain** how lighting a much box near the cap of a charged electroscope would cause the electroscope to discharge (2mks)

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(d) A capacitor was full charged to a potential of 40v. The capacitor is connected as shown in the figure 12 to discharge at load resistor R. Sketch a graph to show how the capacitor discharges with time (2mks)

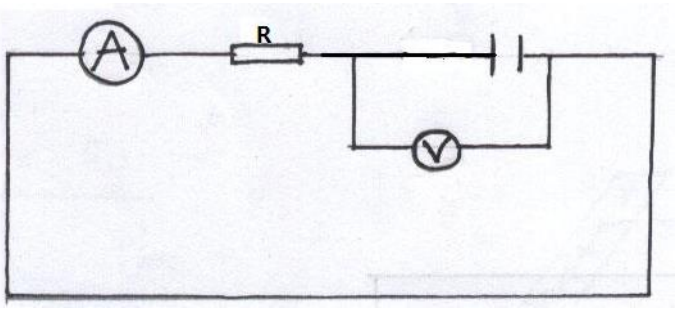

Figure 12

(e) Sketch an electric field pattern for an isolated negative charge. (1mk)

19. (a) **What** is meant by a radioactive substance? (1mk)

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(b) **Give two** reasons why alpha particles are more ionizing than βeta. (2mks)

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(c) $^{233}_{90}TH$ disintegrates into radium (Ra) by emission of two alpha and two beta particles **State**:

(i) the atomic number of the daughter nuclide (2mks)

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(ii) The mass number of the daughter nuclide (2mks)

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(d) One of the applications of βeta emission (β) is controlling thickness gauge. **Explain** how they are used for this purpose. (2mks)

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