

NAME.....

INDEX NO.....

SCHOOL.....

SIGN.....

DATE.....

232/2

PHYSICS

PAPER 2

FORM 4

MARCH 2013

TIME: 2 HOURS

PENTAGON JOINT EXAMINATIONS (WARENG DISTRICT)

The Kenya Certificate of Secondary Education

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided.
- Sign and write date of examination
- 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
- Non-programmable silent electronic calculators and KNEC mathematical tables may be used

FOR EXAMINERS USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
A	1 – 12	25	
B	13	13	
	14	13	
	15	14	
	16	8	
	17	7	
	TOTAL SCORE	80	

SECTION ONE

1. A bar magnet A attracts an iron nail as shown in figure 1.

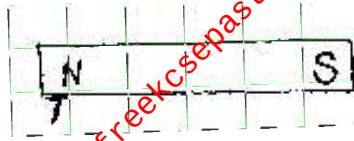


Fig. 1

A second bar magnet B of the same strength is brought close to the magnet A as shown in Fig. 1



Fig. 2

State and explain the observation made.

(2mark)

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2. A plane mirror with an incident ray at an angle of 55° from the mirror is rotated through angle of 10° about an axis through the point of incidence. State two possible angles of reflection. (2marks)

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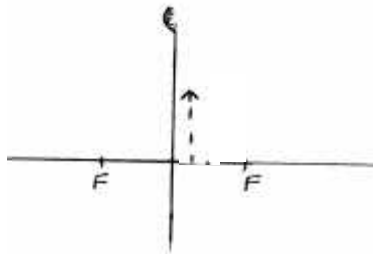
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3. The figure below shows the image I, formed in a convex mirror. Complete the ray diagram to show the position of the object. (2marks)

Fig. 3



4. Fig. 7 shows bar magnet being plunged towards a coil.

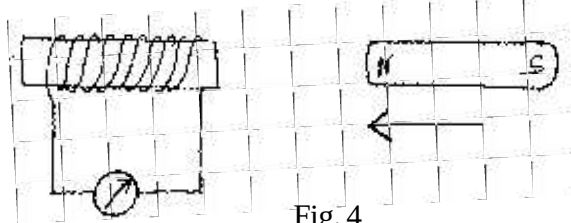


Fig. 4

Use the information above to answer question 7.

Explain how the current is produced.

(2marks)

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5. The figure below shows the set-up for a simple cell.

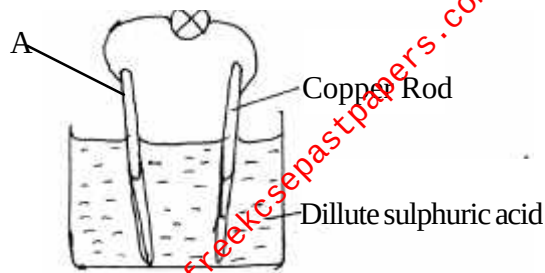


Fig. 5

- i) Name the electrode A. (1mark)

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- ii) Explain why the bulb goes off after only a short time. (1mark)

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6. Fig. 1 below shows an arrangement of resistors in a circuit.

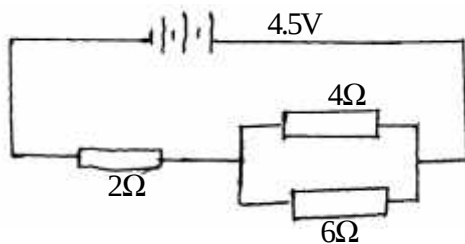


Fig.6

- Calculate the effective resistance in the circuit and hence the current in the 6Ω resistor. (3marks)

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7. The fig. 7 shows circular waves approaching a plane barrier in uniform medium.

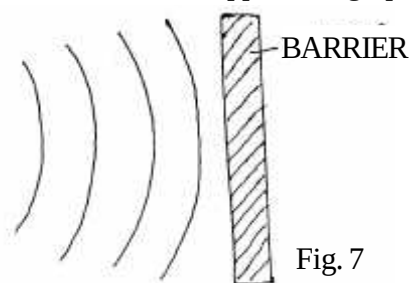


Fig. 7

- On the diagram sketch the reflected waves. (2marks)

8. An electromagnet is made by winding insulated copper wire on an iron core. State two changes that could be made to increase the strength of the electromagnet. (2marks)

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9. Determine the speed of light in water given that the speed of light in air is $3.0 \times 10^8 \text{ ms}^{-1}$ and the refractive index of water is 1.33. (3marks)

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10. State the difference between sound produced by a piano and a guitar of the same frequency. (1mark)

11. A boy claps each time he hears an echo of the clap from a wall 15m away. If the speed of sound is 330m/s, determine the time interval between the claps. (3marks)

12. Name the two electromagnetic waves with largest wavelengths and the eyes are sensitive. (1mark)

13. a) The figure below shows an object in front of a convex lens.



i) Using rays locate the image as seen by observer, E. (2marks)

ii) Give one application of such a lens as used above. (1mark)

iii) Write three similarities between an eye and a camera. (3marks)

b) Figure (a) and (b) show diagrams of the human eye;



i) In figure (a), sketch a ray diagram long sightedness. (1mark)

ii) In figure (b), sketch a ray diagram showing how lens is used to correct the long sightedness. (2marks)

- c) An object of height 10.5cm stands before a diverging lens of length 20cm and a distance of 10cm from the lens. Determine;

i) Image distance (2marks)

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ii) Height of the image. (1mark)

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iii) Magnification (1mark)

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14 . a) Define capacitance. (1mark)

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- b) In fig below, a sharp pin is fixed on a cap of a leaf of the electroscope. The electroscope is highly charged and then left for some time.

State and explain the observation made after sometime. (2marks)

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- c) Figure below shows a circuit where a battery of e.m.f 4.5V, switches A and B, two capacitors $C_1 = 0.5\mu\text{F}$ and $C_2 = 1.0\mu\text{F}$ and a voltmeter are connected.

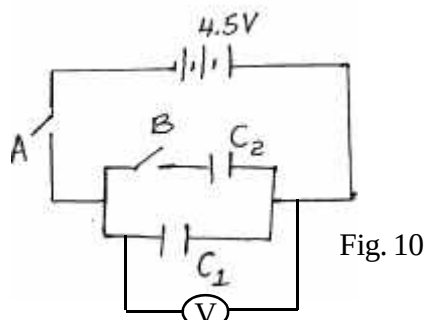


Fig. 10

- i) Determine the charge on C_1 when both switch A is closed and switch B is open. A (2marks)

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ii) What is the effective capacitance C_1 when both switches A and B are closed? (2marks)

iii) State and explain what is observed on the voltmeter when;

I. Switch A is closed and switch B is open. (2marks)

II. Switch A is closed and opened and then B is closed. (2marks)

d) Fig. 11 shows a pair of parallel plated of capacitors connector to a battery. The upper plate is places slightly to the left.

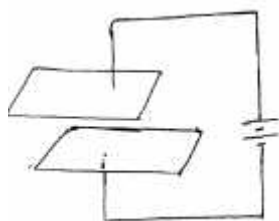


Fig. 11

Suggest two adjustments that can be made to so as to reduce the effective capacitance. (2marks)

15. a) State Lenz's law of electromagnetic induction. (1mark)

b) In figure 12 below the bar magnet is moved into the coil.

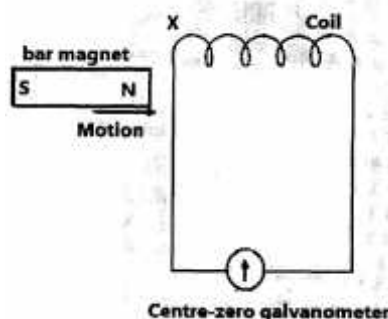


Fig 12

i) State and explain what is observed in the galvanometer? (2marks)

ii) Explain briefly the source of an electrical energy in the circuit. (2marks)

c) State any two ways in which power is lost from the transformer and explain how each loss is minimized. (2marks)

- d) A transformer is used to provide a potential difference of 100KV to an X-ray tube from 250V a.c mains supply.

A current of 100mA flows in the X-ray tube and the transformer is 100% efficient.

Calculate:

- i) The ratio of the number of turns of the secondary coil to the number of turns in the primary coil. (3marks)

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- ii) The current in the primary coil. (2marks)

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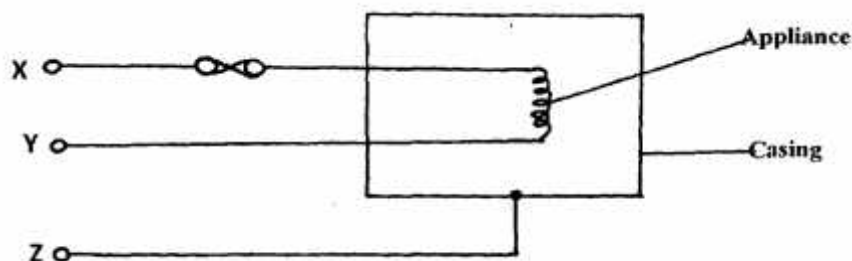
- iii) State giving reasons which of the coils of the transformer is thinner. (2marks)

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SECTION TWO 55MARKS

16. The figure below shows the wiring in a modern mains appliance.



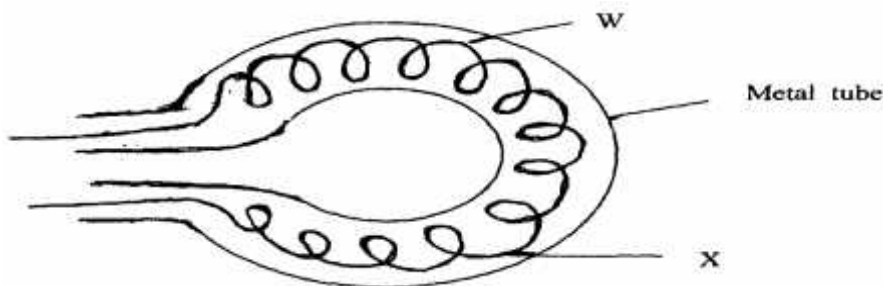
Identify the wires Y and Z.

Y _____

Z _____

(2marks)

- a) The figure below represents part of an electric cooker coil.



- i) State why the part labeled W is coiled. (1mark)

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ii) State the property of material X that makes it suitable for its use. (1mark)

b) State the advantage of transmitting power at:-

i) Very high voltage. (1mark)

ii) Altering voltage. (1mark)

c) A household used a 1.5Kw water heater for 2 hours a day for 30 days. If the cost of electricity is Shs. 6.70Kwh, how much will they pay for this consumption? (3marks)

17. a) State one use of the CRO. (1mark)

b) Draw a diagram of the electron gun labeling its parts. (3marks)

c) When the time-base is off, the length of the line on CRO screen is 4cm peak to peak for an AC voltage 400V. Determine the sensitivity setting. (3marks)