Name: …… **Index No.:**…….....

School: ……. **Candidate's Sign:**……...

Date:…..……..…….....

232/2
PHYSICS
PAPER 2
TIME: 2 HOURS

2018

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

PHYSICS
PAPER 2
2 HOURS

INSTRUCTIONS TO THE CANDIDATES

- Write your ***name*** and ***index 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*** workings ***must*** be clearly shown.
- Mathematical table and silent non programmable electronic calculators may be used.
- Candidates should answer the questions in ***English.***

For Examiner's Use Only:-

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1 – 13	25	
B	14	14	
	15	10	
	16	13	
	17	11	
	18	7	
TOTAL SCORE		**80**	

This paper consists of 13 printed pages.
Candidates should check the question paper to ascertain that all pages are printed as indicated.
And that no questions are missing.

SECTION A (25 MKS): ***Answer all questions in this section in the spaces provided.***

1. **Figure 1** shows a ray of light incident on a mirror at an angle of 45^0. Another mirror is placed at an angle of 45^0 to the first one as shown

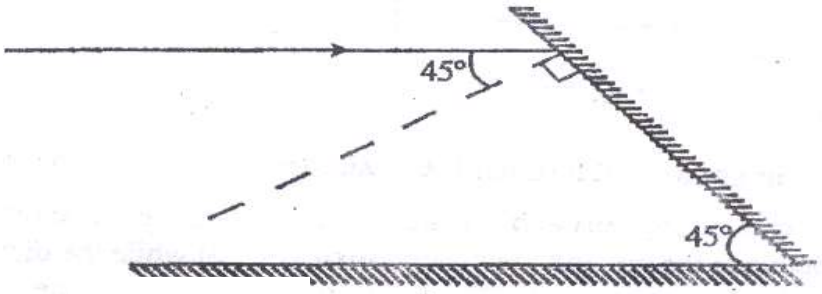

FIGURE 1

Sketch the path of the ray until it emerges (2 mks)

2. A positively charged sphere is suspended by an insulating thread. A negatively Charged conductor is suspended near it. The conductor is first attracted, after touching the sphere, it is repelled. Explain this observation. (2mks)

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3. **Figure 2** shows a soft iron bar AB placed in a coil near a freely suspended magnet.

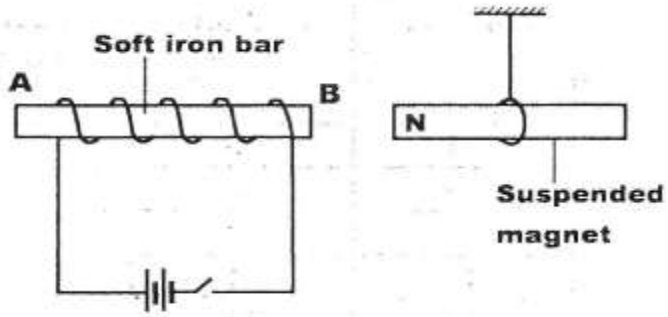

Figure 2

Explain the observation made when the switch is closed. (2 mks)

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4. Table 1 shows radiations and the irrespective frequencies.

Type of radiation	Yellow light	Gamma rays	Radio waves	Micro waves
Frequency (Hz)	1×10^{15}	1×10^{22}	1×10^{6}	1×10^{11}

Arrange the radiations in the order of increasing energy. (l mk)

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5. A heating coil is rated 100W, 240V. At what rate would it dissipate energy if it is connected to a 220V supply? (3mks)

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6. **Figure 3** shows a ray of light incident on the face of a water prism

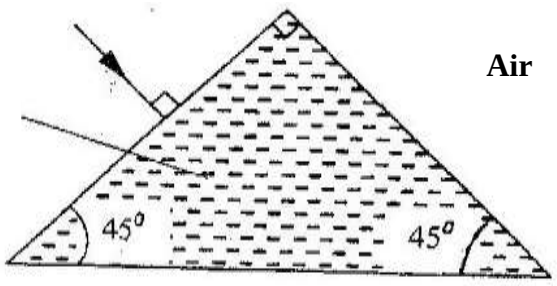

Figure 3

Sketch the path of the ray as it passes through the prism. Critical angle for water is 49^0 (1 mk)

7. State the reason why electrical power is transmitted over long distances at very high voltages. (1 mk)

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8. A boy standing in front of a cliff blows a whistle and hears the echo after 0.5s. He then moves 17 metres further away from the cliff and blows the whistle again. He now hears the echo after 0.6s. Determine the speed of the sound. (3 mks)

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9. **Figure 4** shows a human eye with a certain defect

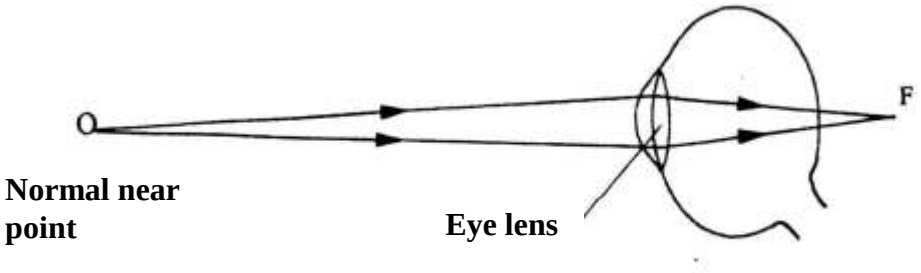

Figure 4

(i) Name the defect (1 mk)

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(ii) On the same diagram, sketch the appropriate lens to correct the defect and sketch rays to show the effect of the lens. (2mks)

10. **Figure 5** shows straight waves incident on a diverging lens placed in a ripple tank to reduce its depth.

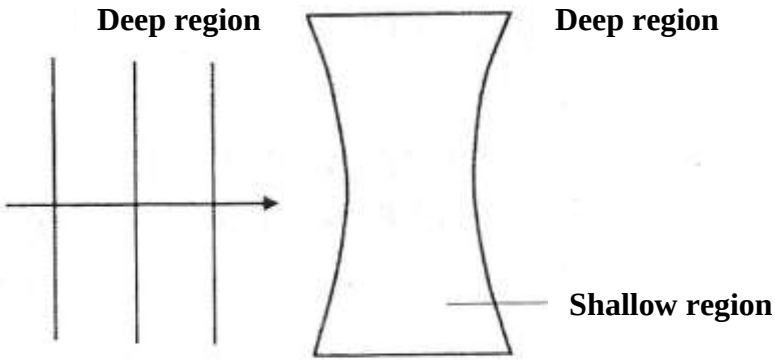

Figure 5

Complete the diagram to show the waves in both the shallow region and beyond the lens (2 mks)

11. A narrow beam of electrons in a cathode ray oscilloscope (CRO) strike the screen producing a spot. State what is observed on the screen if a low frequency a.c source is connected across the y-input of the CRO (1mk)

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12. Polarisation is a defect of a simple cell. State how it reduces the current produced and how this defect can be minimized (2 mks)

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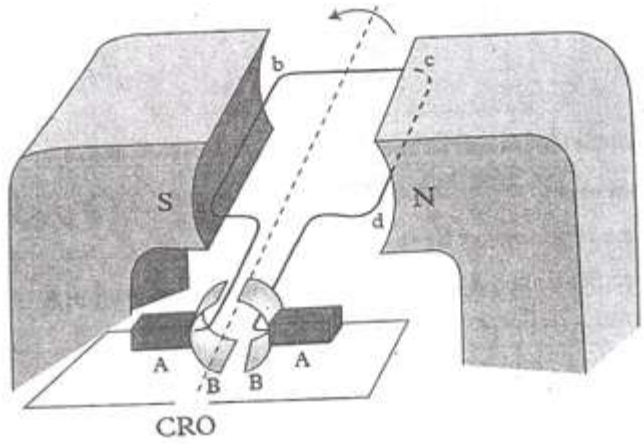
13. The figure below shows a d.c generator.



Name the parts labeled A and B (2marks)

A ……

B ……

SECTION B (55 MKS): ***Answer all questions in this section in the spaces provided.***

14. (a) State Ohm's Law (1 mk)

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(b) The graph in **figure 7** shows the current – voltage characteristics of a certain device, X

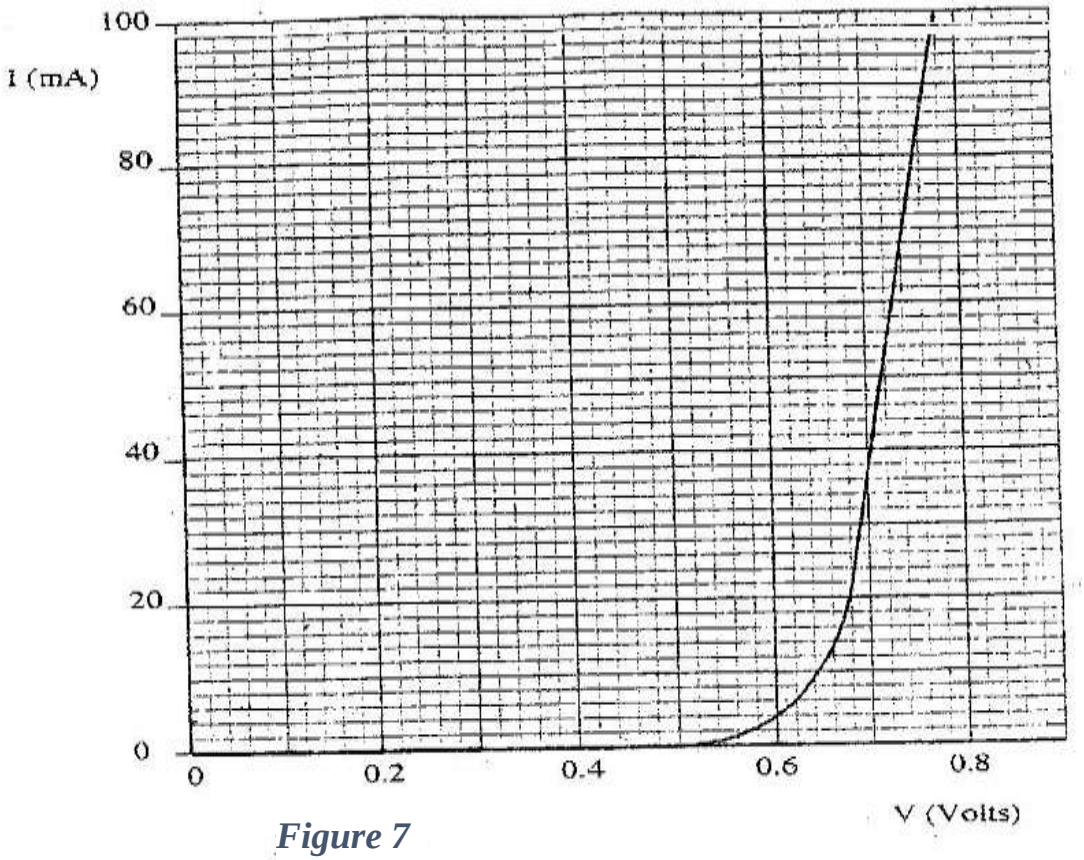

Figure 7

(i) State with a reason whether the device obeys Ohm's law (2 mks)

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(ii) Determine the resistance of the device, X, when the current through it is 60 mA. (3 mks)

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(iii) When the device, X is connected in the circuit below, the voltage across it is 0.70 V.

R

X

O V

Calculate the value of the resistance R. (3 mks)

(c) The cell in **figure** has an e.m.f of 2.1 V and negligible internal resistance.

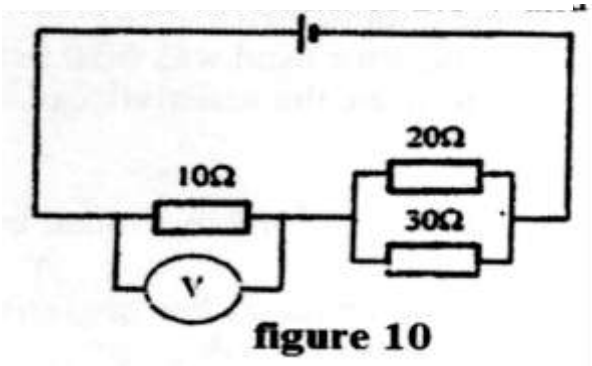


figure 10

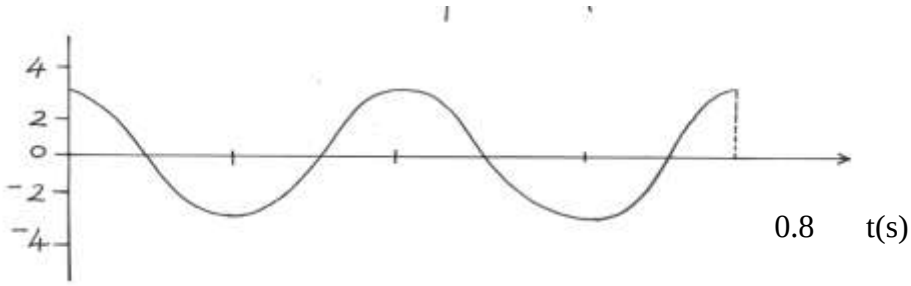
Determine the

(i) Effective resistance in the circuit (2 mks)

(ii) Current in the circuit (1 mk)

(iii) Reading of the voltmeter (2 mks)

15. (a) The figure below shows the displacement-time graph of a wave traveling at 400cm/s.



Determine for the wave, the :

(i) Amplitude (1mk)

(ii) Period (1mk)

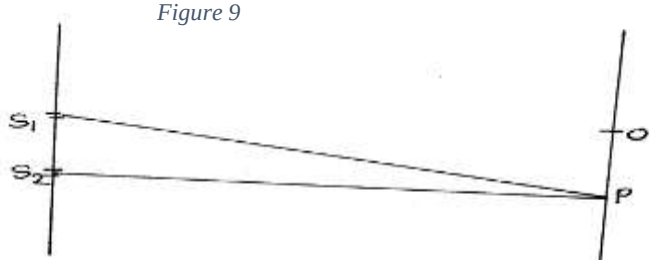
(iii) Frequency (2mks)

(iv) Wavelength (3mks)

(b) I) How are sound waves different from radio waves. (1mk)

II) **Figure 9** below shows the waves starting from two coherent sources S_1 and S_2.

Figure 9



What would be observed at P if the waves are;

i) Light waves (1mk)

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ii) Sound waves (1mk)

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16. (a) The Figure**,** shows a circuit that may be used to charge a capacitor.

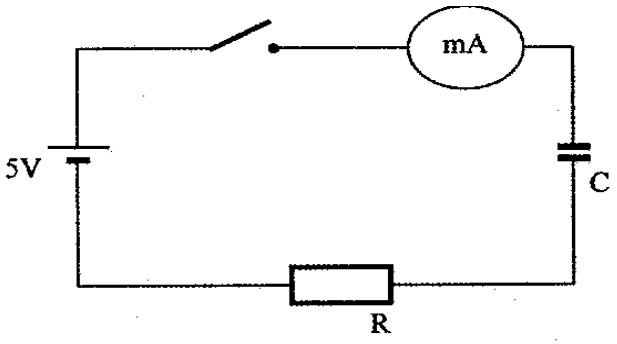

Figure 8

(i) State the observation on the milliameter when the circuit is switched on: (1mk)

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(ii) Explain the observation in (i) above. (2mks)

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(b) The circuit in **figure** 8 is left on for some time. State the value of p.d. across:

(i) the resistor R; (1mk)

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(ii) the capacitor C; (1mk)

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(c) Sketch the graph of potential difference (V) across R against time. (3mks)

(d) **The Figure** shows three capacitors connected to a 10V battery.

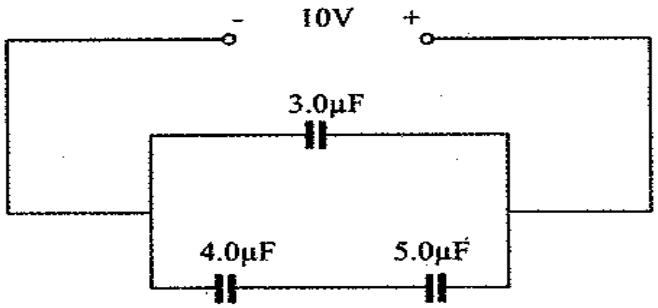

Figure 9

Calculate:

(i) the combined capacitance of the three capacitors; (3mks)

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(ii) the charge on the 5.0 μF capacitor. (2mks)

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17. (a) Figure 12 shows two circuits close to each other

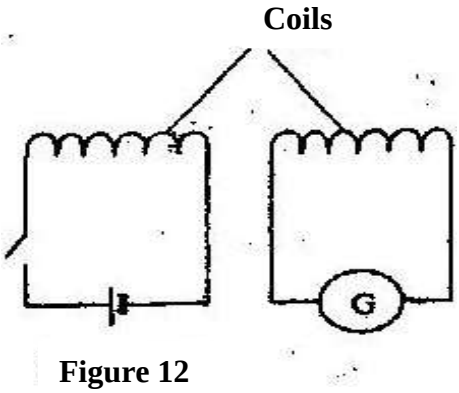

Figure 12

When the switch is closed, the galvanometer shows a reading and then returns to zero. When the switch is then opened, the galvanometer shows a reading in the opposite direction and then returns to zero. Explain these observations. (3 mks)

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b) An ideal transformer has 2000 turns in the primary circuit and 200 turns in the secondary circuit. When the primary circuit is connected to a 400V a.c. source the power delivered to a resistor in the secondary circuit is found to be 800W. Determine the current in:

(i) The secondary circuit (3 mks)

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(ii) The primary circuit (3 mks)

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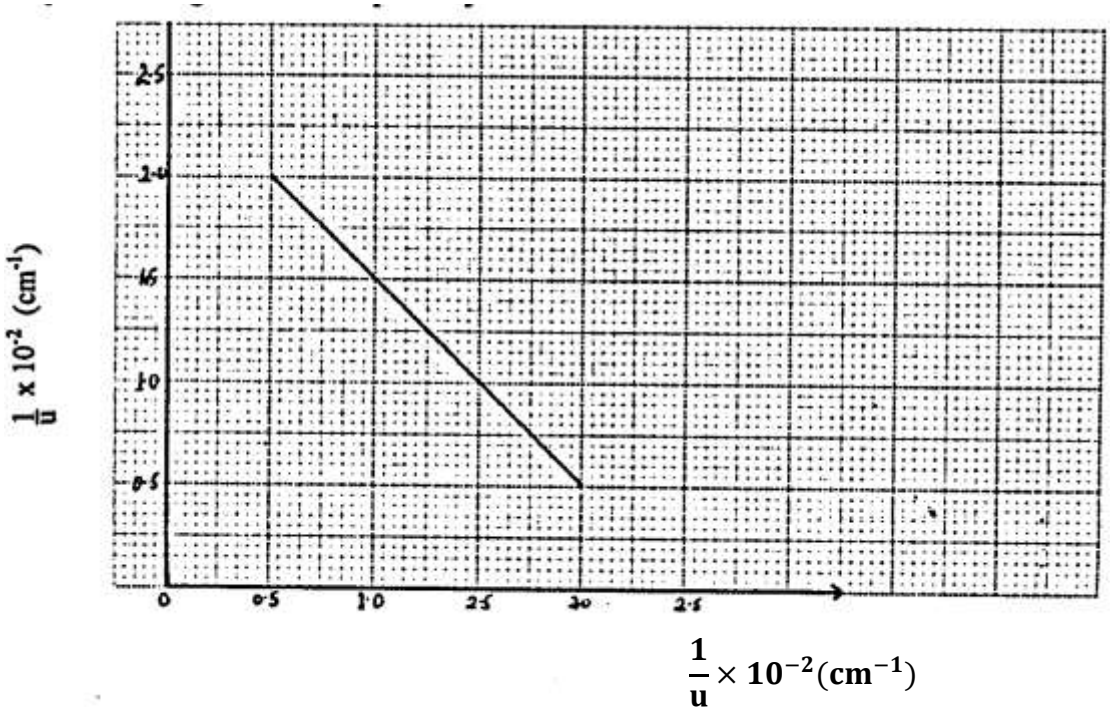
c) Explain how energy losses in a transformer are reduced by having **a soft- iron core** (2 mks)

18. a) The graph figure below shows the relationship between $\frac{1}{u}$ and $\frac{1}{v}$ for a converging lens where u and v are the object and image distances respectively.



From the graph, determine the focal length, f of the lens. (3 marks)

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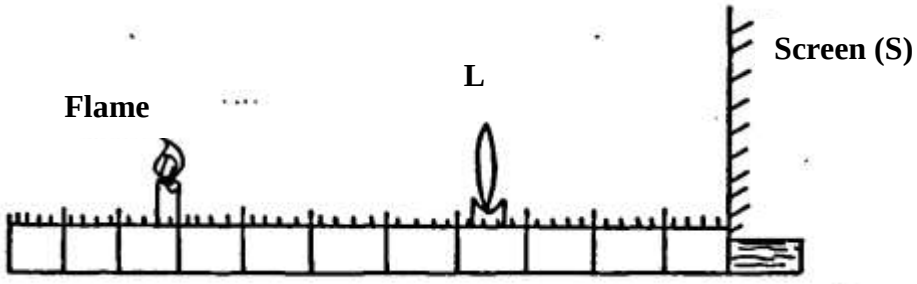
b) Figure below shows an experimental set up consisting of a mounted lens, I, A screens, a metre rule and a candle



i) Describe how the set up may be used to determine the focal length f, of the lens. (3 marks)

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ii) State why the set up would not work if the lens were replaced with a diverging lens. (1 mark)

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