

Name:.....Index No: .....Adm. No.....

CLASS ..... Candidates signature..... Date: .....

232/2

PHYSICS

TIME: 2 HOURS

## KAMDARA JET-2016

### INSTRUCTIONS TO THE CANDIDATES

- Write your name and index number in the spaces provided.
- Mathematical tables and silent non-programmable calculators may be used.
- This paper consists of section A and B.
- Attempt all the questions in the spaces provided.
- All working must be clearly shown.

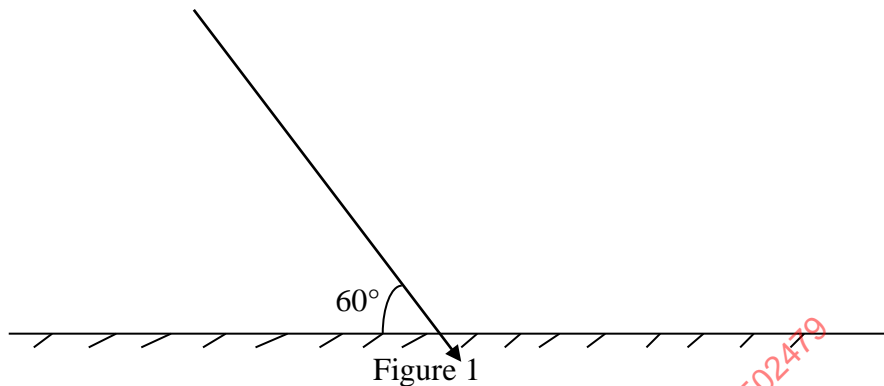
### For Examiners Use Only

Section	Question	Maximum Score	Candidate's Score
A	1-13	25	
B	14	10	
	15	10	
	16	13	
	17	12	
	18	10	
	<b>TOTAL</b>	<b>80</b>	

*This paper consists of 16 printed pages. Candidates should check the question paper to ascertain that all pages are printed as indicated and that no question is missing.*

**SECTION A (25 Marks)**

1. A ray of light makes an angle of  $60^\circ$  with a plane mirror as shown in Figure 1 below. The mirror is rotated through an angle of  $20^\circ$  about the point O in a clockwise direction.



Determine the new angle of reflection.

(2mks)

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2. Describe how you would charge a gold leaf electroscope by induction method (2mks)

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3. The figure 2 below shows a wire wound on a soft iron core.

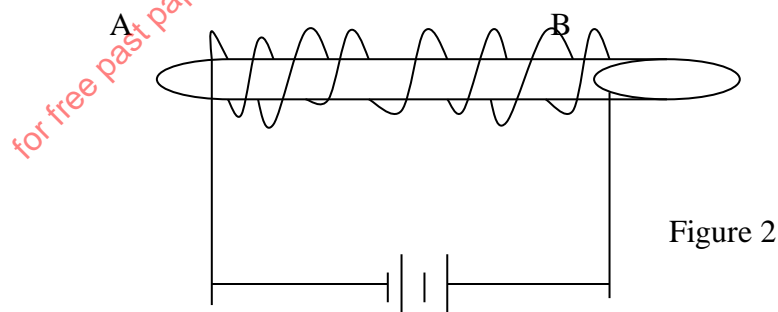


Figure 2

Indicate the polarities of end A and B

(2mks)

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4. Describe two defects in simple cells and ways in which they can be minimized. (2mk)

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5. Differentiate between Faradays law of electromagnetic induction and Lenz law. (2mks)

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6. Figure 3 below shows a moving coil microphone.

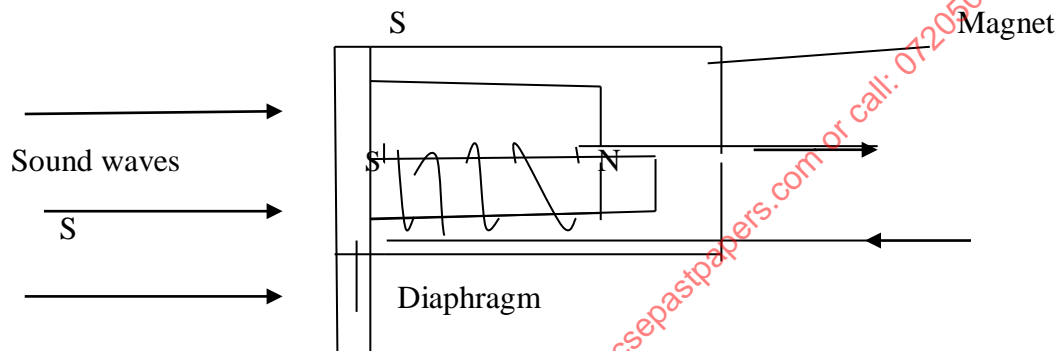


Figure 3

Briefly explain how it works. (2mks)

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7. An object is placed on the principal axis of a concave mirror. The image formed is upright and magnified. If the object distance is 5cm and the image distance is 10 cm, determine the focal length of the mirror. (2mks)

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8. a) Differentiate between a transverse and a longitudinal wave. (1mk)

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b) Kenyatta National Hospital uses x-rays of wavelength  $1 \times 10^{-11} \text{m}$ . Calculate the frequency of the x-rays. (Take  $c = 3 \times 10^8 \text{m/s}$ ) (2mks)

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9. A hunter standing some distance from a cliff blows a whistle and hears its echo 2 seconds later. How far is the cliff from the hunter? (speed of sound in air =  $340 \text{m/s}$ ) (2mks)

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10. Calculate the speed of light in a medium of refractive index  $\frac{4}{3}$  given that the speed of light in air is  $3 \times 10^8 \text{m/s}$ . (2mks)

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11. A wire of length  $1.5 \text{m}$  offers resistance of  $6.5 \Omega$  to the flow of current through it. If the cross section area is  $5.0 \times 10^{-6} \text{m}^2$ . calculate the resistivity of the material. (2mks)

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12. The Figure 4 below shows two coils used to demonstrate mutual induction.

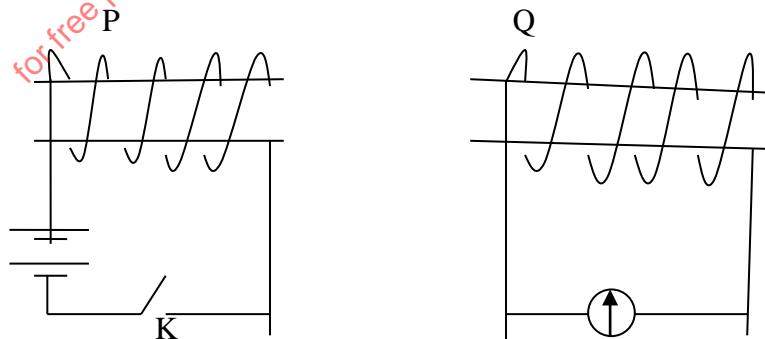


Figure 4

State what happens to the galvanometer when K is closed.

(1mk)

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13. Figure 5 below shows two parallel plate capacitors separated by a distance  $d$  units. Each plate has an area of  $A$  square units.

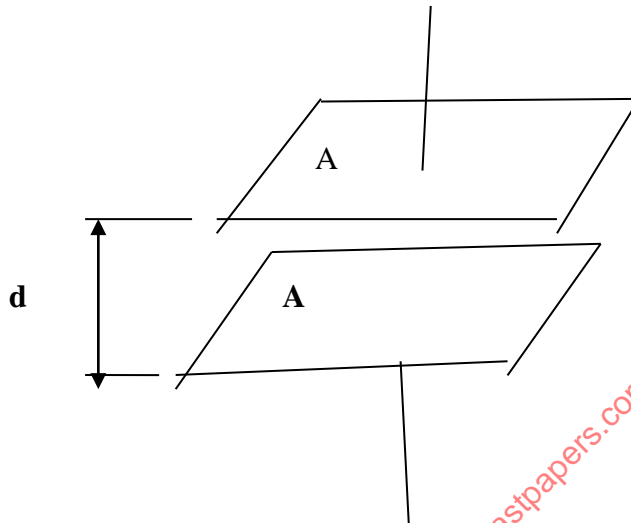


Figure 5

Suggest one adjustment that can be made so as to increase the effective capacitance.

(1mk)

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### SECTION B (55 MKS)

14. (a) What is the purpose of a fuse?

(1 mark)

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- (b) The diagram in figure 9 below shows a ring – main circuit used by an electrician in a certain house.

- (i) Identify two faults in the installation.  
(2 marks)

(2 marks)

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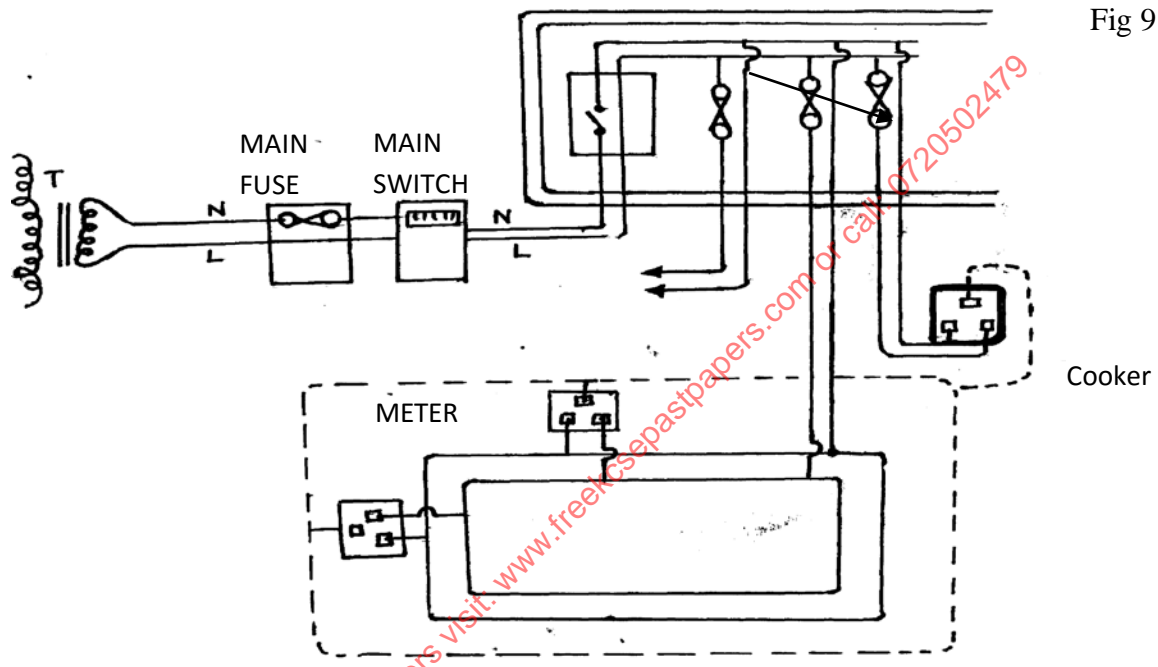


Fig 9

- ii) Explain why the 3 – pin plug fuse has a longer earth pin than the live and neutral pins.

(2 marks)

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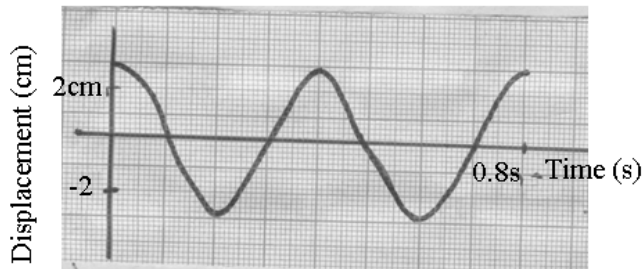
iii) Identify the type of transformer T used in the diagram in Fig. 9 (1 mark)

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(c) A cooker rated 2.0kW was operated for 40minutes each for 30days. If the cost of each kilo – watt – hour unit is Shs. 15.50, Calculate the cost of electricity used. (4 marks)

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



Determine for the wave the:

(i) Amplitude (1mk)

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(ii) Period (1mk)

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(iii) Frequency (2mks)

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(iv) Wavelength (3mks)

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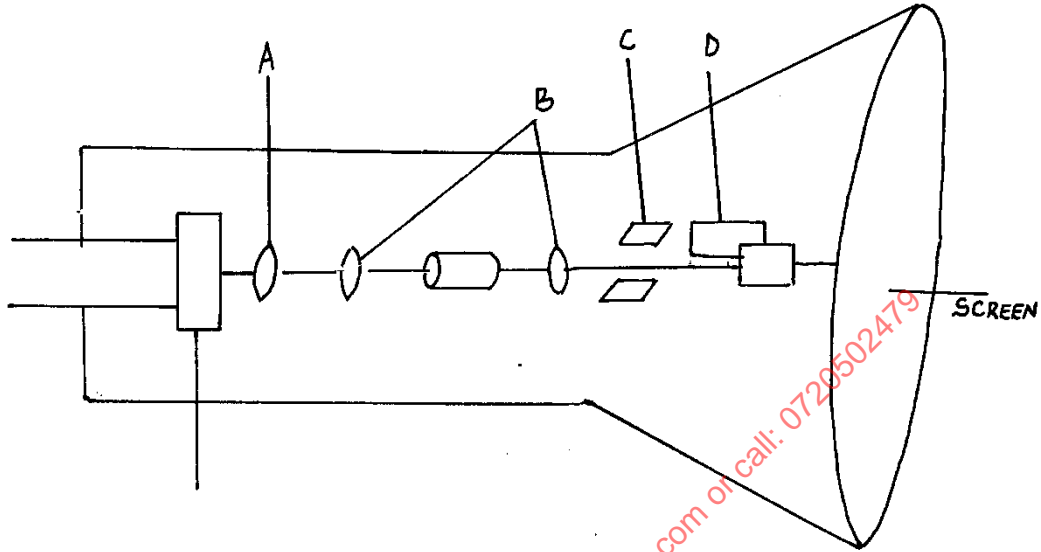
(b) The human ear can distinguish two sounds as separate only if they reach it at least 0.1s apart. How far from a wall must an observer be in order to hear an echo when he shouts? (Speed of sound in air =  $330\text{ms}^{-1}$ ) (3mks)

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16 The figure 7 below represents a cathode ray oscilloscope (C.R.O)



i) Name the parts labeled A and B (2mks)

A.....  
 B.....

ii) What are the functions of parts labeled C and D (2mks)

C.....  
 D.....

iii) Explain how electrons are produced. (2mk)

.....  
 .....

iv) Give a reason why the tube is evacuated. (1mk)

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((b) i) Distinguish between cathode rays and light rays (2mks)

.....  
 .....

(ii) State the function of A (1mk)

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(iii) An alternating p.d is applied across the Y-plates. State what is the effect on the position of the spot on the screen? (1 mark)

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(iv) A signal with a frequency of 50Hz is applied across the Y-plates. If the time base with a period of 0.04s is applied across the X-plates, sketch a graph of p.d against time showing the number of waves that can be seen on the screen of the C.R.O (2 mks)

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v) The tube of the CRO is coated with graphite. State three functions of the graphite coating (3mks)

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17.(a) State one similarity and one difference between a concave lens and a convex mirror

(2mks)

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(b) A lens forms a focused image on a screen when the distance between the object and the lens is 100cm. the size of the image is twice that of the object.

(i) What kind of lens was used? Give a reason

(2mks)

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(ii) Determine the distance of the image from the lens

(2mks)

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(iii) Determine the power of the lens

(3mks)

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(c) The figure shown in figure 9 shown below is a human eye with a certain defect

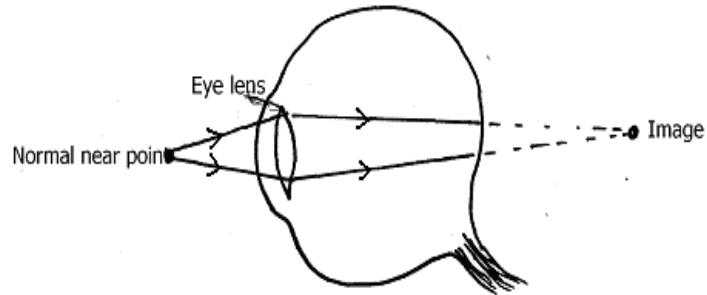


FIG 9

(i) Name the defect

(1mk)

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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)

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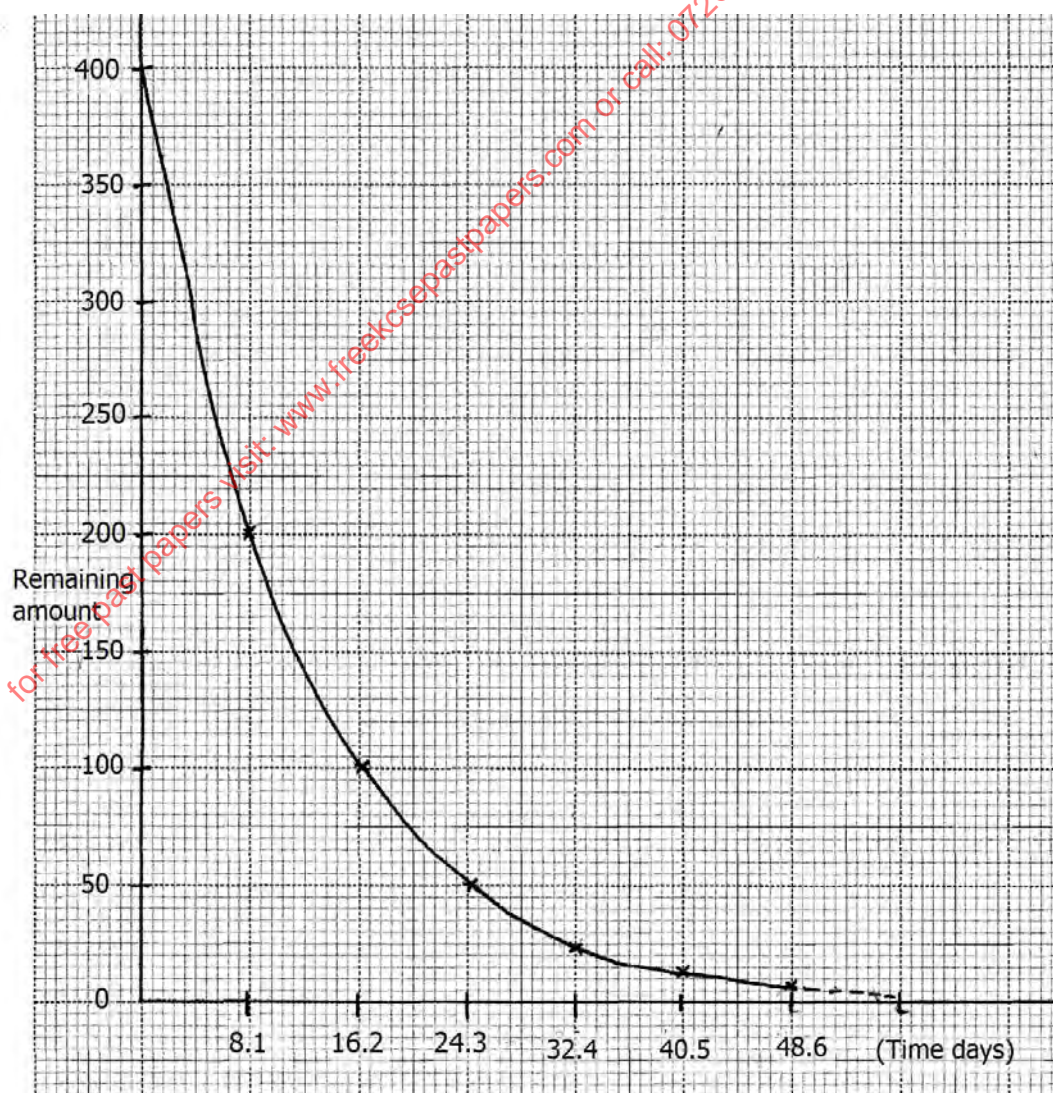
18 a) Name any two types of radiations given out in a radioactive process. (2marks)

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b) The half – life of cobalt – 60 is 5years.

How long will a sample take for the activity to decrease to  $\frac{1}{16}$  of its original value. (3mks)

c) The graph below shows radioactive decay of iodine.



Use the graph to determine the:-

(i) fraction of the amount remaining after 16.2 days. (2mks)

(ii) determine the half – life of iodine. (2mks)

(iii) mass remaining after 17 days. (1mk)

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