

Name Index No.

School Candidate's Signature

232/2

Date

PHYSICS

Paper 2 (Theory)

July/August 2016

Time: 2 Hours

NTIMA, NYAKI AND MUNICIPALITY CLUSTER EVALUATION 2016
Kenya Certificate of Secondary Education

PHYSICS

Paper 2

July/August 2016

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INSTRUCTIONS TO CANDIDATES

- * Write your name and index number in the spaces provided above.
- * Sign and write the date of examination in the spaces provided above.
- * This paper consists of **TWO** sections; A and B
- * Answer **ALL** the questions in section A and B
- * All working and answers must be written on the question paper in the spaces provided.
- * All working must be clearly shown.
- * Mathematical tables and silent electronic calculators may be used.
- * **Take $g = 10\text{ms}^{-2}$**

For Examiner's Use Only

Section	Question	Maximum score	Candidate's score
A	1 - 12	25	
B	13	10	
	14	9	
	15	11	
	16	10	
	17	11	
	18	5	
Total Score		80	

SECTION A : (25 MARKS)

1. Figure 1 below shows a vibrating hack saw blade.

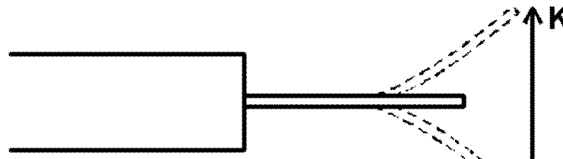


Fig. 1

The time interval for the blade to move from K to L is 0.008 seconds. Determine the frequency of vibration. (3 marks)

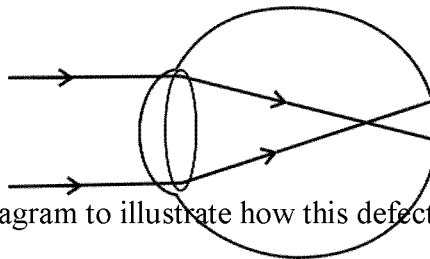
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2. Figure 2 is an illustration of short sightedness.



Draw a separate **Fig. 2** diagram to illustrate how this defect can be corrected. (3 marks)

3. Define the term sulphation as applied to lead acid cells. (1 mark)

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4. A student making a simple cell in the laboratory realised that the current quickly falls to a very small value. State a possible cause for this. (1 mark)

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5. A device is marked 1000W 240V. What fuse rating would be suitable for the device. (3 marks)

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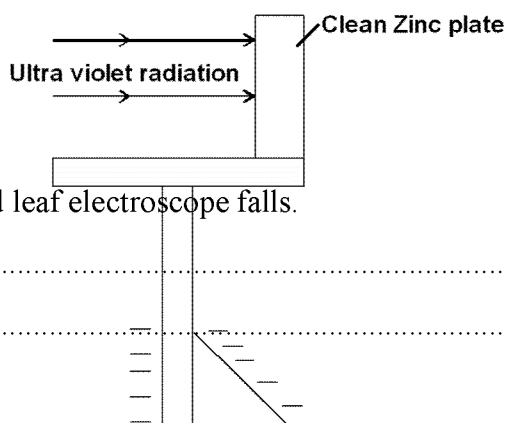
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6. A step up transformer connected to a 40V supply is designed to deliver power to a lamp rated 240V 100W. Given that transformer is 95% efficient, determine the current in the primary winding when the lamp is connected. (3 marks)

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7. Explain with the aid of diagrams how you can charge an electroscope negatively by induction method. (3 marks)

8. Figure 3 shows ultra violet radiation striking a clean zinc plate on a negatively charged gold leaf electroscope.

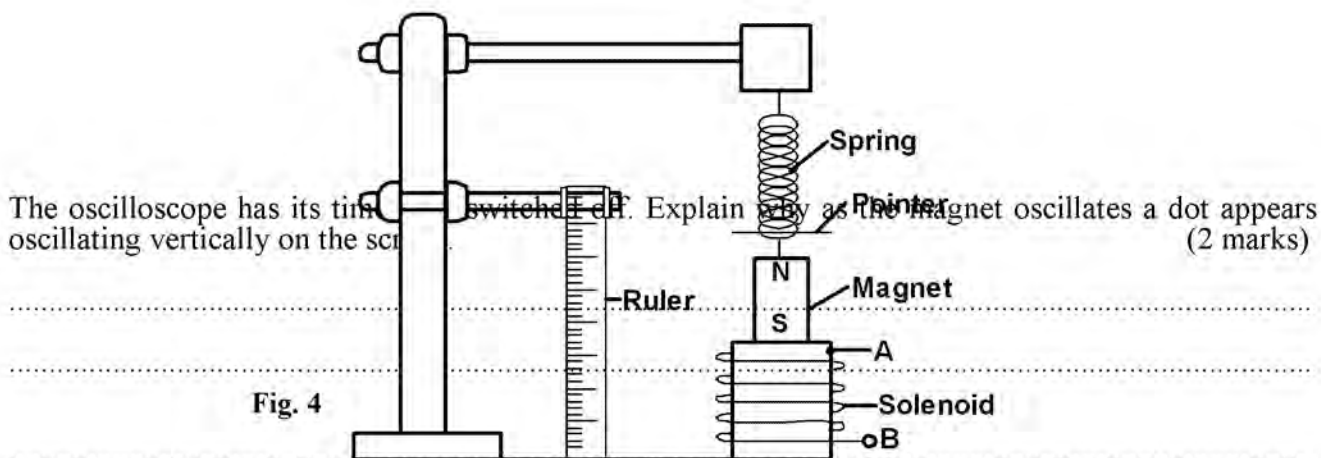


Explain why the leaf of the gold leaf electroscope falls.

(2 marks)

Fig. 3

9. Figure 4 shows a set up used by a student to investigate electromagnetic induction. He extends the spiral spring until the South pole of the magnet is in the middle of the coil and releases the spring. The e.m.f induced is measured using an oscilloscope connected across A and B.

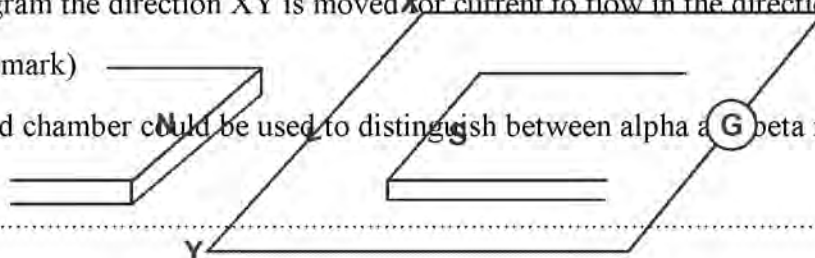


10. Figure 5 shows a wire XY at right angles to a magnetic field. XY is part of a circuit containing a galvanometer.

Indicate on the diagram the direction XY is moved for current to flow in the direction shown.

(1 mark)

11. Explain how a cloud chamber could be used to distinguish between alpha and beta radiations. (2 marks)



12. State one use of ultra violet waves. (1 mark)

SECTION B :

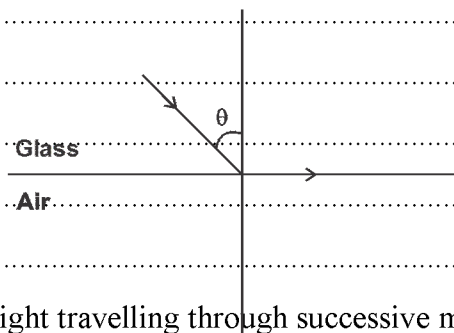
13. a) Define the term critical angle. (1 mark)

b) A ray of light passes in a glass block as shown in the figure 6 below.

Given that the refractive index of glass is 1.5, determine angle θ .

(3 marks)

Fig. 6



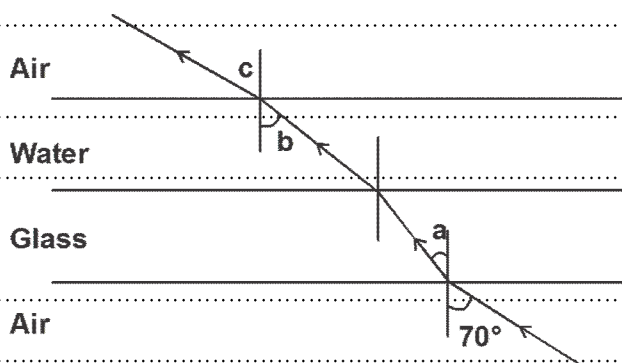
c) Figure 7 shows a ray of light travelling through successive media.

Given that the refractive index of glass is $\frac{3}{2}$ while that of water is $\frac{4}{3}$ determine :

(2 marks)

i) angle a

Fig. 7



ii) angle b

(2 marks)

iii) angle c

(2 marks)

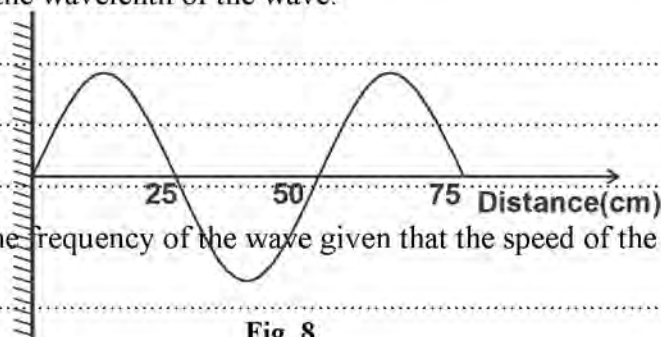
14. a) Figure 8 is an illustration of a wave pattern.

i) State with reason the type of wave shown.

(2 marks)

ii) Determine the wavelength of the wave.

(1 mark)



iii) Calculate the frequency of the wave given that the speed of the wave is 9m/s.

(3 marks)

Fig. 8

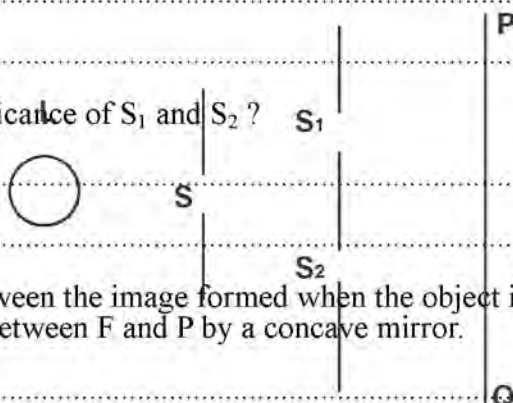
b) Figure 9 shows a monochromatic source of light L behind a barrier with a single slit S placed behind another barrier with two identical slits S_1 and S_2 . A screen PQ is placed in position as shown.

i) Explain what is observed on screen PQ.

(2 marks)

ii) What is the significance of S_1 and S_2 ?

(1 mark)



15. a) State two differences between the image formed when the object is between C and F and the one formed when the object is between F and P by a concave mirror.

(2 marks)

- b) An object is placed 60cm from of a concave lens of focal length 40cm. Determine the position of the image. (3 marks)

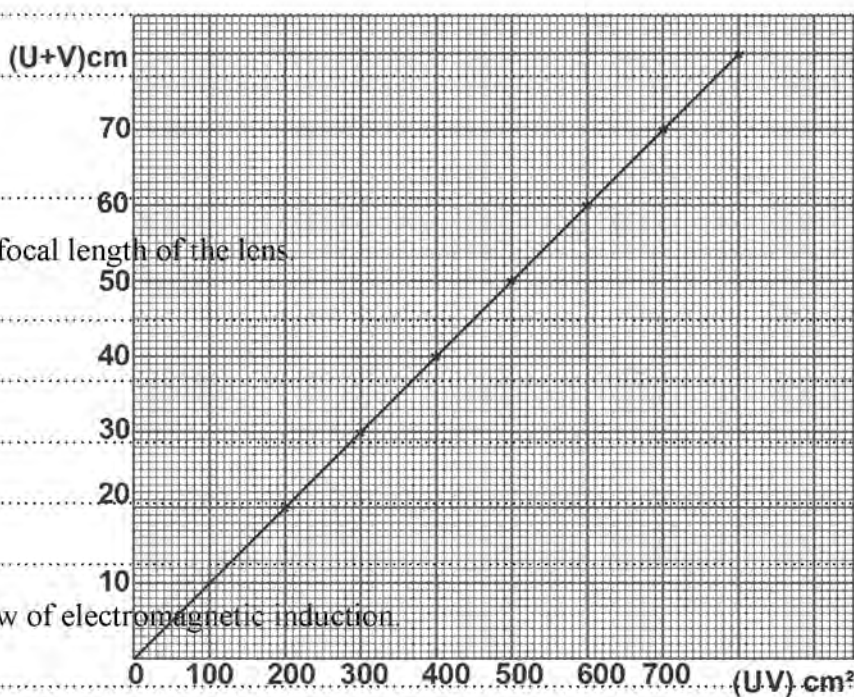
- c) Figure 10 chows a graph drawn from an experimental data to determine the focal length of a convex lens.

- i) Determine the slope of the graph. (3 marks)

Fig. 10

- ii) Determine the focal length of the lens. (3 marks)

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



b)

A wire placed between the poles of two permanent magnets is connected as shown in figure 10.

i) State and explain what is observed when the wire is moved up and down. (2 marks)

ii) Suggest two ways of altering the magnitude of the effect you have stated in (i) above. (2 marks)

c) Explain why the core of a transformer is :

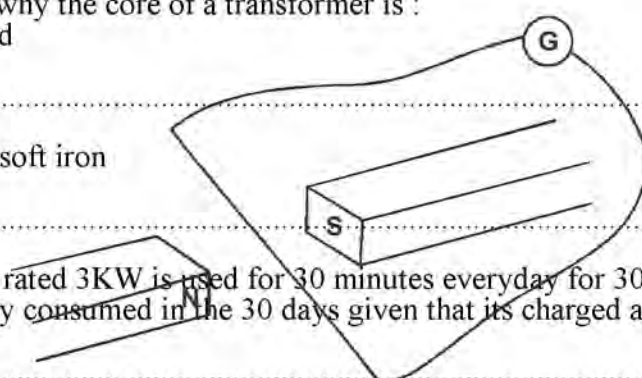
i) laminated

(1 mark)

ii) made of soft iron

(1 mark)

d) A heater rated 3KW is used for 30 minutes everyday for 30 days. Calculate the cost of the electricity consumed in the 30 days given that its charged at Ksh.7.00 per unit. (3 marks)



17. Figure 11 shows the main parts of an X-ray tube.

a) Name the parts labelled Q and R. (2 marks)

Q

R

b) Explain the effects on the X-rays produced when :

i) the ammeter reading is raised. (2 marks)

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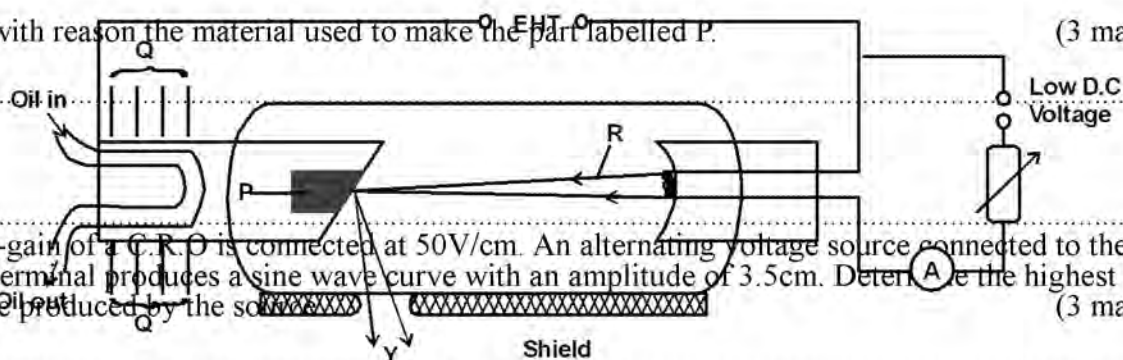
ii) the extra high tension voltage (EHT) is increased. (2 marks)

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c) State with reason the material used to make the part labelled P. (3 marks)

Fig. 11



d) The Y-gain of a C.R.O is connected at 50V/cm. An alternating voltage source connected to the input terminal produces a sine wave curve with an amplitude of 3.5cm. Determine the highest voltage produced by the source. (3 marks)

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18. Figure 12 shows a network of 4 resistors.

i) Determine the ammeter reading. (3 marks)

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ii) Determine the voltmeter reading.

(2 marks)
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Fig. 12

