

NAME INDEX NO.

SCHOOL DATE

SIGNATURE

232/2

PHYSICS

PAPER 2

(THEORY)

JULY/AUGUST 2017

TIME: 2 HOURS.

SCHOOL BASED FORM 4 EXAM JULY-AUGUST 2017

Kenya Certificate of Secondary Education

INSTRUCTIONS TO CANDIDATES.

- This paper consists of two sections A and B.
- Sign and write the date of examination in the spaces provided.
- Answer **ALL** the questions in the spaces provided after each question.
- **ALL** working must be clearly shown.
- Electronic calculators, mathematical tables may be used
- All numerical answers should be expressed in the decimal notations.
- $g = 10\text{ms}^{-2}$

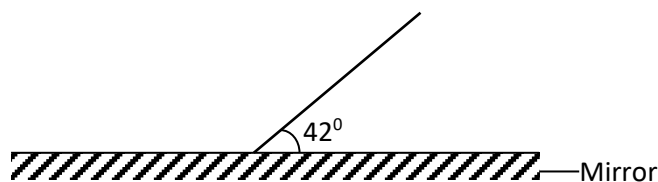
FOR EXAMINER'S USE ONLY.

Section	Question	Maximum score	Candidate's score
		80	
A	1 – 12	25	
B	13	5	
	14	4	
	15	6	
	16	6	
	17	7	
	18	7	
	19	7	
	20	5	
	21	4	
	22	4	
	TOTAL	80	

This paper consists of 8 printed pages. Candidates should check to ensure that they have all the pages and that no question or part of question is missing.

SECTION A (25 MARKS)

1. The figure below shows a ray of light incident on a mirror.



Determine the angle of reflection when the mirror is rotated 10° anticlockwise. (2 mks)

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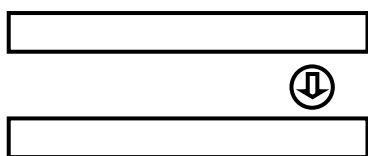
2. A soldier standing some distance from a cliff blows a whistle and hears its echo 0.9 seconds later. How far is the cliff from the soldier? (Take speed of sound in air = 330m/s) (3 mks)

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3. The figure below shows two bar magnets and a plotting compass.



Draw the magnetic field pattern round the bar magnets indicating the polarity of each. (2 mks)

4. Other than the thickness of a conductor, state any other factor that affects the resistance of an ohmic conductor. (1 mk)

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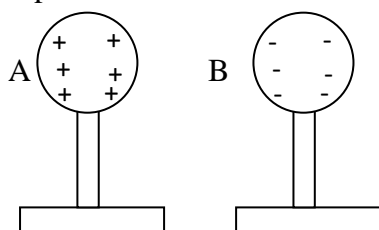
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5. Explain how local action reduces the e.m.f in a simple primary cell. (1 mk)

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6. The figure below shows two charged spheres A and B if the two spheres are brought into contact and then separated, complete the diagram showing the charge distribution on the two spheres after separation.



7. A pendulum bob takes 1.5 seconds to move from its mean position to a maximum displacement position. Calculate its frequency. (3 mks)

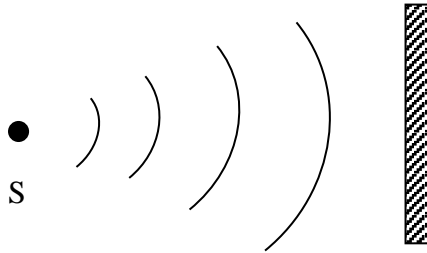
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8. State two factors that affect the capacitance of a capacitor. (2 mks)

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9. State two application of a convex mirror. (2 mks)

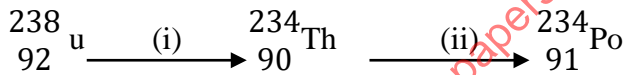
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10. The figure below shows circular waves approaching a plane barrier in a uniform medium.



Sketch the reflected waves on the same figure (2 mks)

11. An electric kettle has an element of resistance 30Ω . It is operating from a 240V main supply. Determine its power rating. (3 mks)

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12. The following is part of a radioactive particles emitted in stages (i) and (ii).



Identify the radioactive particles emitted in stages (i) and (ii) (2 mks)

SECTION B (55 MARKS)

13. An x-ray tube produces x-rays whose wavelengths vary from 6.0×10^{-13} to 9.0×10^{-13} m. Determine
(i) The range of frequency of x-rays (2 mks)

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(ii) The highest energy of x-rays (3 mks)
(Take $C = 3.0 \times 10^8$ m/s and $h = 6.4 \times 10^{-34}$ Js)

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14. The primary coil of transformer has 10,000 turns and the secondary coil has 10 turns. The transformer is connected to a 240V a.c sources. Determine

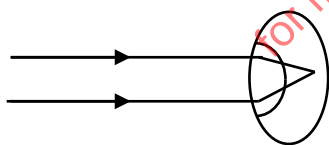
(i) the output voltage (2 mks)

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(ii) the output current when the primary coil has a current of 0.5A (Assume there are no energy loss) (2 mks)

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15. (a) The figure below show an eye defect.



(i) State one possible cause of the defect. (1 mk)

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(ii) Draw on the same diagram to show how the defect can be corrected. (1mk)

(iii) State the type of defect above. (1 mk)

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(b) An object O placed in front of a converging lens L_o forms an image I on the other side of the lens. Another converging lens L_e is placed such that the two form a compound microscope.

(i) Draw a ray diagram of the set up to show how the final image is formed. (2 mks)

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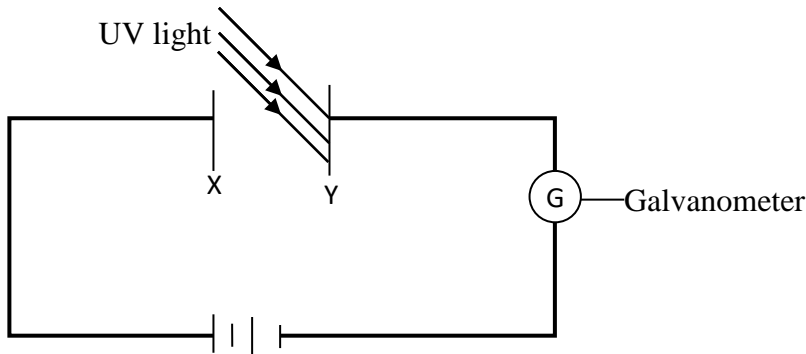
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(ii) State the reason why the focal length of L_o must be greater than L_e . (1 mk)

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16. (a) The figure below shows metal plates X and Y. Metal Y is illustrated by ultra-violet radiation.



(i) State the observation made on the galvanometer. (1 mk)

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(b) A material has a work function of 2.0eV . Determine the largest wavelength of incident radiation that can cause photoelectrons to be emitted from its surface.

($C = 3.0 \times 10^8 \text{ m/s}$, $h = 6.6 \times 10^{-34} \text{ Js}$, $1\text{eV} = 1.6 \times 10^{-19} \text{ J}$)

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17. (a) State Ohm's law (1 mk)

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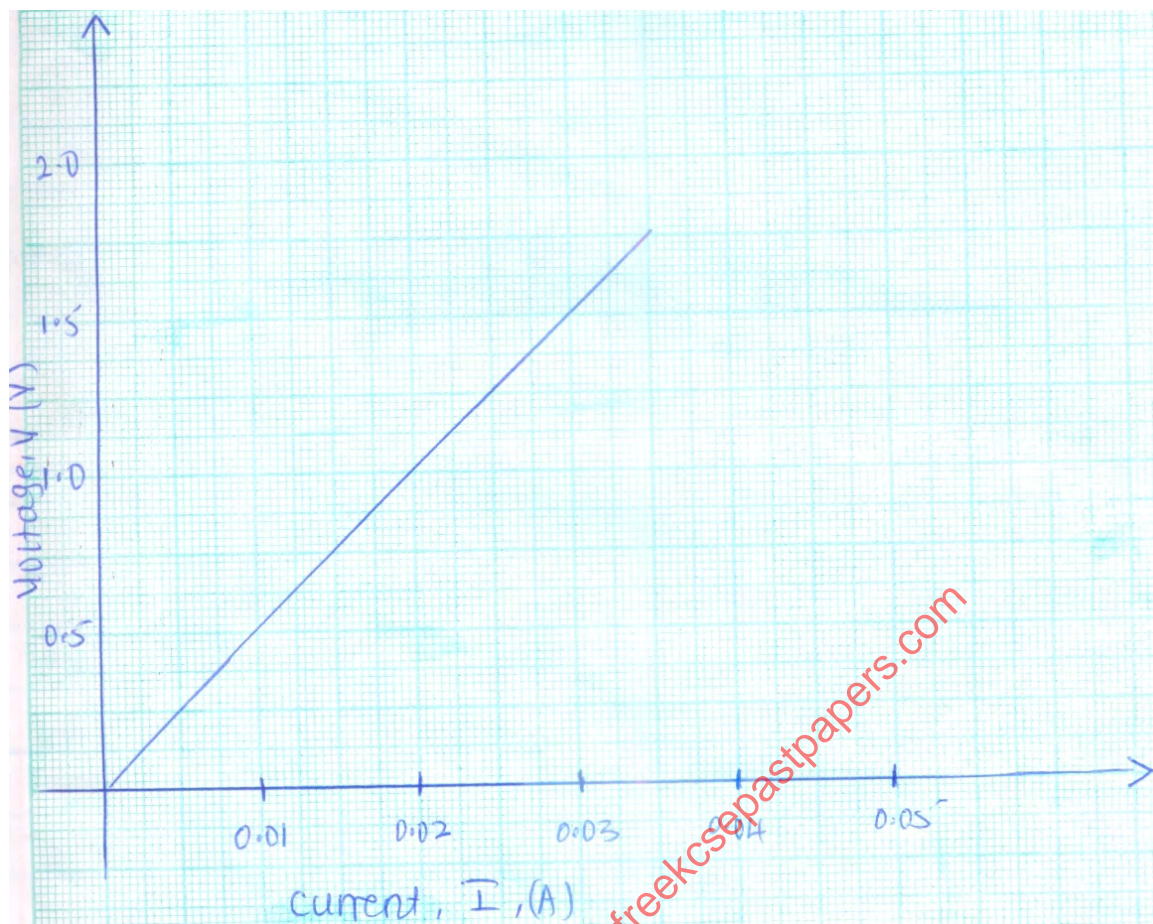
(b) A starter coil has a current of 6A passing through it. If the p.d across it is 12V , determine the resistance of the starter coil. (2 mks)

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(c) The graph below shows the voltage current relationship for a certain conductor.



(i) Determine the resistance of a conductor. (2 mks)

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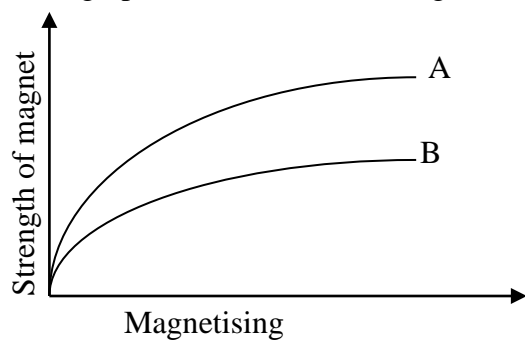
(ii) State with a reason whether the conductor obey Ohm's law. (2 mks)

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18. (a) The graph below shows two magnetic materials.



- (i) Which material is easier to magnetise? (1 mk)

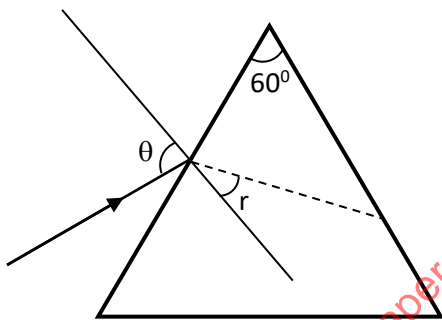
 (ii) Which material forms a stronger magnet? (1 mk)

 (iii) State one application of each material (2 mks)

 (b) Differentiate between hard and soft magnetic materials (2 mks)

 (c) State one property of a magnet. (1 mk)

19. The figure below shows the paths of a ray light through a glass prism. The speed of light in the prism is 2.0×10^8 m/s.

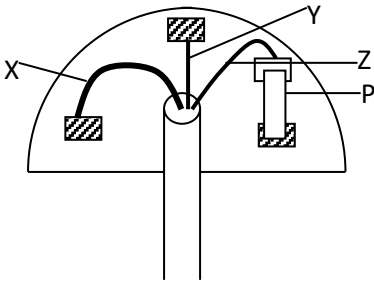


- (a) Determine the refractive index of the prism material. (2 mks)
 (Take speed of light in vacuum, $C = 3.0 \times 10^8$ m/s)

 (b) (i) Show on the same diagram the critical angle, C (1 mk)
 (ii) Determine the value of the critical angle, C (2 mks)

 (c) Given that $r = 32^\circ$, determine angle θ (2 mks)

20. The figure below shows a three pin plug.



(a) Identify the wires X, Y and Z. (3 mks)

X.....

Y.....

Z.....

(b) Give the colour code of the wire connection marked Z. (1 mk)

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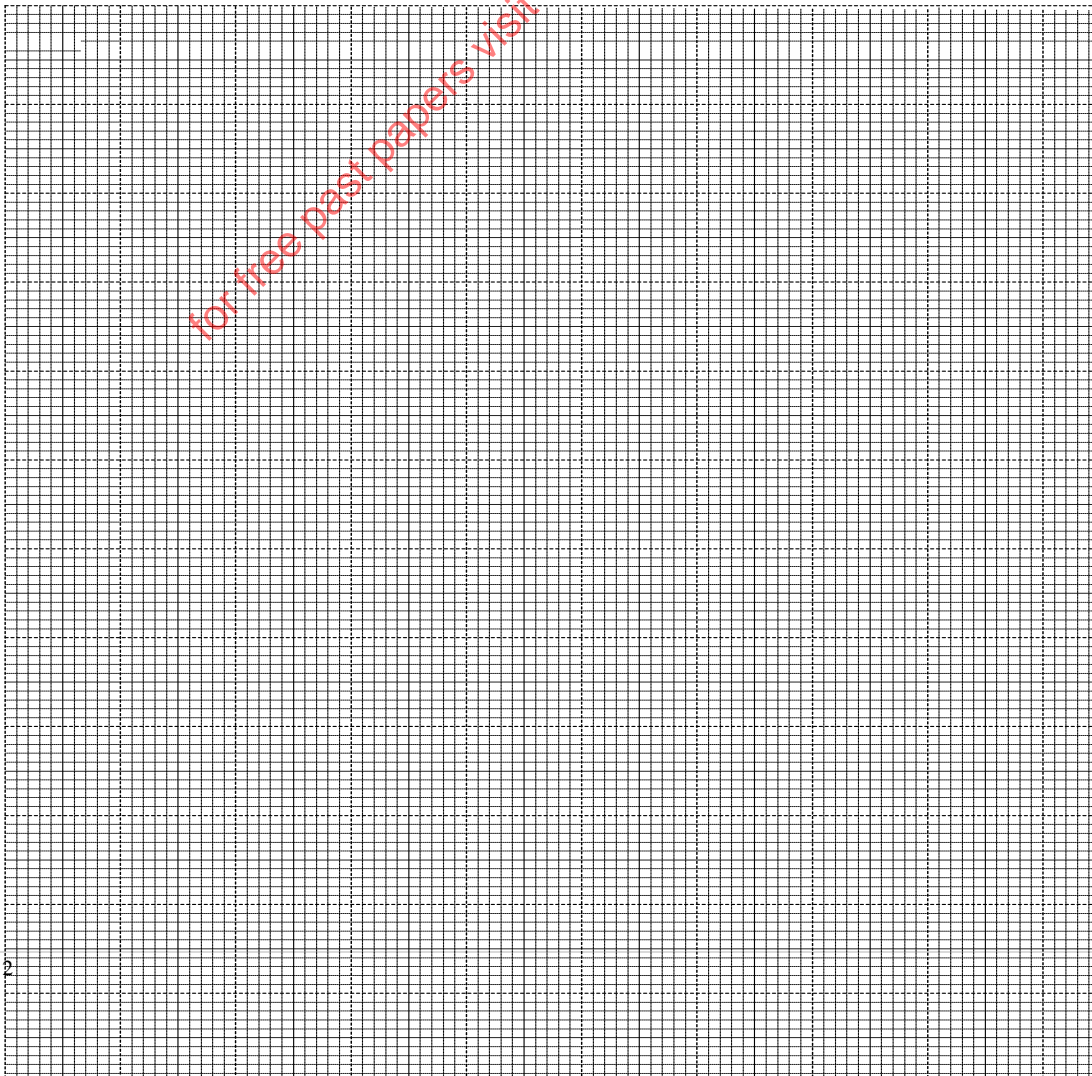
(c) Give a reason why the pin marked Y is normally longer than the other two pins. (1 mk)

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21. (a) Draw the trace on a graph paper to show the wavelength of an a.c voltage of frequency 50HZ and peak voltage 60V. The following are the settings of a cathode ray oscilloscope. (2 mks)

(i) Time base is 5ms/div

(ii) The Y-gain is 20V/div



State the functions of the following parts of a CRO

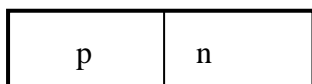
(i) Grid (1 mk)

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(ii) Anodes (1 mk)

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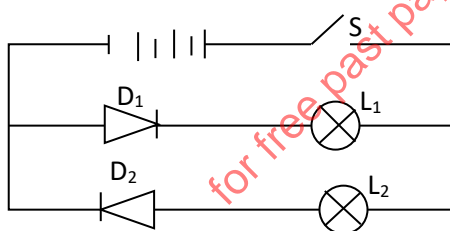
22. (a) The figure below shows a p-n junction diode. Complete the diagram showing a circuit for reverse bias. (1 mk)



(b) Define the term 'doping' as used in electronics (1 mk)

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(c) The figure below shows a circuit with two diodes D_1 and D_2 and lamps L_1 and L_2 .



With a reason state and explain what is observed when switch S is used.

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