Kenya Certificate of Secondary Examination

232/2 -**PHYSICS-** **Paper 2**

(THEORY)

NOV. 2020- 2 Hours

NAME……..INDEX No……

CANDIDATE'S SIGNATURE…….

PHYSICS THEORY P2 DATE…….

INSTRUCTION TO CANDIDATES

a) Write your name and index number in the space provided above
b) Sign and write the date of examination in the space provided
*c) This paper consist of **TWO** sections, A and B*
d) Answer all the questions in section A and B in the space provided
*e) All working **MUST** be clearly shown*
f) Non-programmable silent electronic calculator and KNEC mathematical table may be used
g) This paper consist of 10 pages
h) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing

Section	Questions	Maximum Score	Candidate's Score
A	1-14	25	
B	15	13	
	16	08	
	17	11	
	18	13	
	19	10	
	TOTAL SCORE	**80**	

SECTION A: (25 MARKS)

Answer ALL Questions in this section in space provided

1. At what angle should two plane mirrors placed to produce 5 images? (2marks)

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2. In a simple cell consisting of copper and zinc plates, bubbles of gas are seen forming around the copper plate

i) What is the name given to this defect (1mark)

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j) Suggest how the defect you have named in 1 (i) above can be minimized (1mark)

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3. The diagram shows a 40Ω resistor connected in series to a battery of 6V and negligible internal resistance. Calculate the power dissipated (2marks)

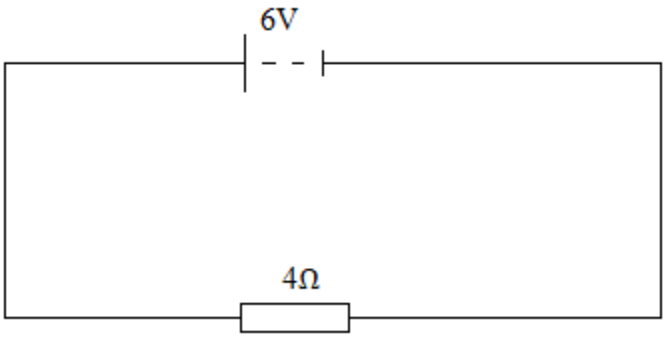

Figure 1

4. One way of magnetizing a magnet is hammering. Explain the magnetization is achieved (2marks)

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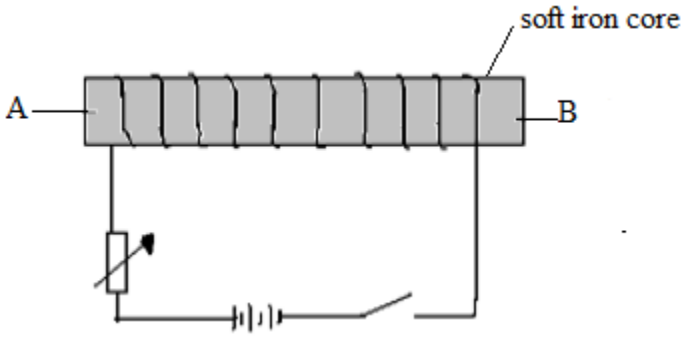
5. Figure 2 below shows a solenoid wound on a soft iron core



State the polarities at point A and B when the switch is closed (1mark)

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6. Figure 3 below shows a display of an a.c signal on a CRO screen.

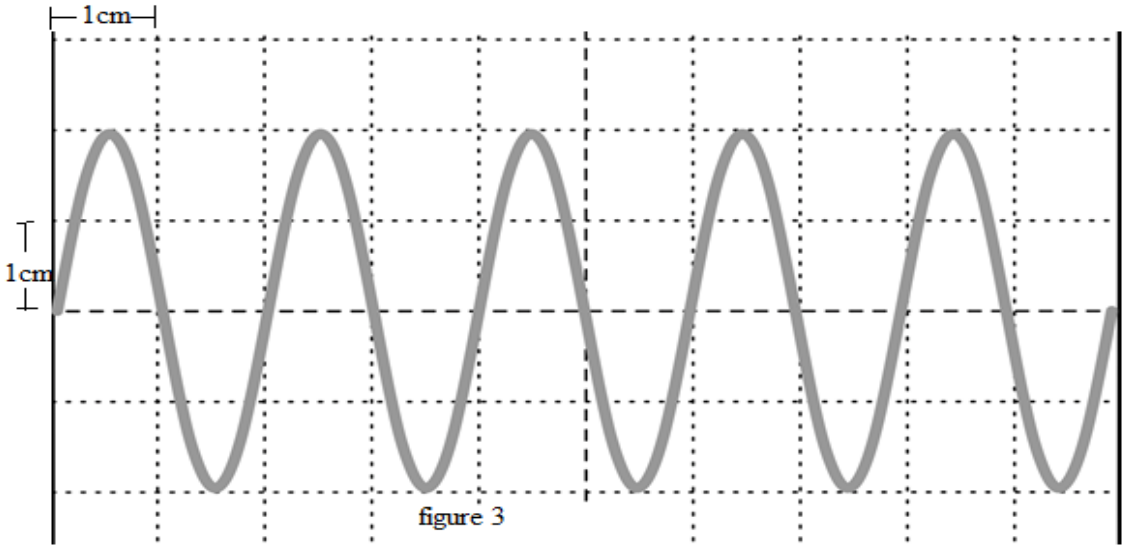

figure 3

Determine the frequency given that the time base setting is 200ms per division (2marks)

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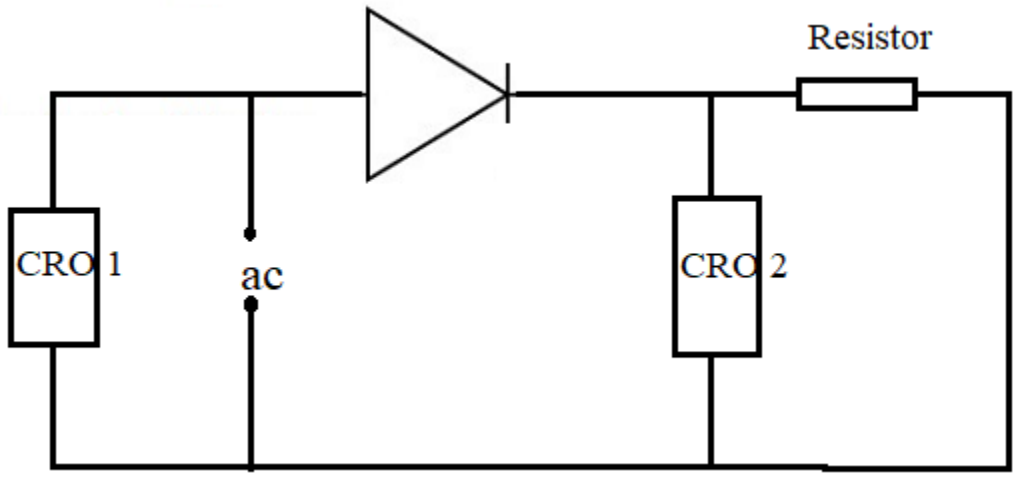
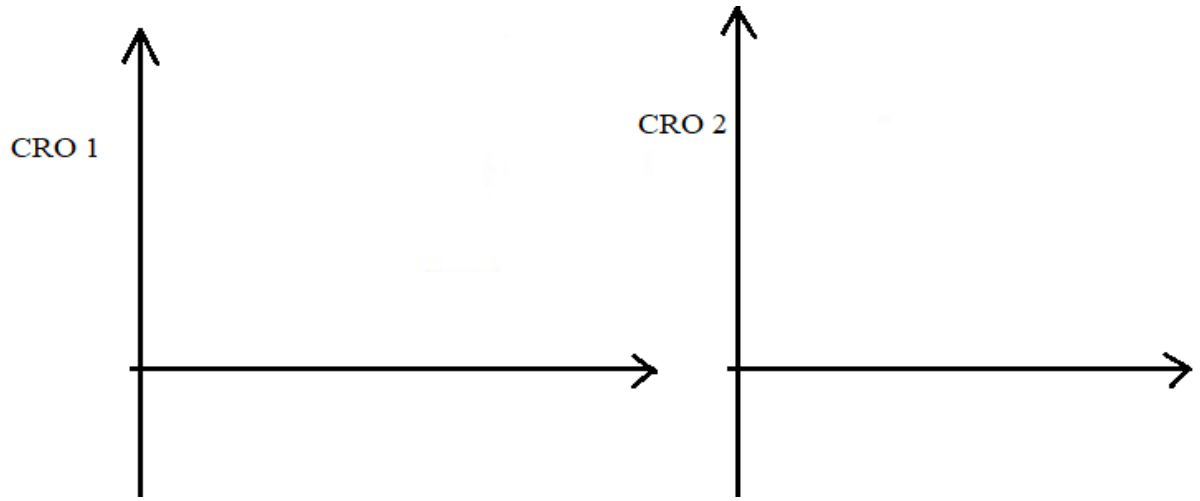
7. Figure 4 below shows a diagram consisting of a diode, an AC voltage source, a resistor and two cathode ray oscilloscope (CRO1) and (CRO2)



Sketch the voltage through CRO1 and CRO2 (2marks)



8. State TWO reasons why Alluminium is preferred to copper in transmission of power (as overhead cables) (2marks)

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9. Define the term 'wavelength' of a transverse wave (1mark)

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10. A boy standing 400m away from a cliff claps his hands and hears an echo 2.5s later Determine the speed of sound in air (2marks)

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11. Velocity of light in water is 2.2×10^{8}m/s while in glass velocity is 2.0×10^{8}m/s. Calculate the angle of incidence in water which could produce an angle of 30^{0} in glass (2marks)

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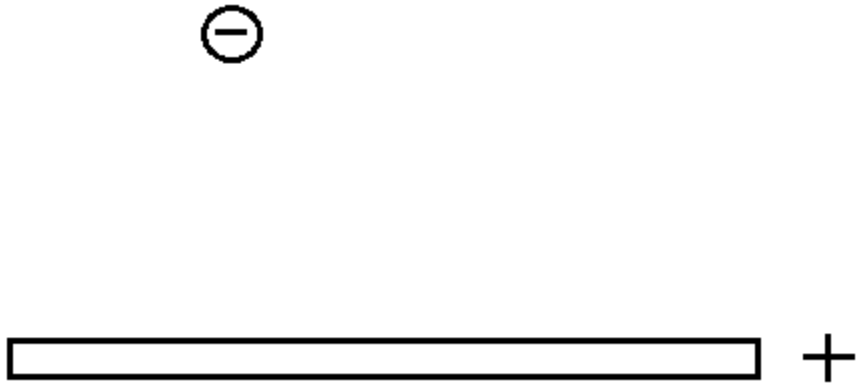
12. The diagram below shows a point charge close to a flat positive charge. Draw the electric field between them (1mark)



13. A virtual image of height 4cm is formed using a convex lens of focal length 20cm. If the size of the object is 1cm, determine the position of object (3marks)

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14. Table below shows part of the electromagnetic spectrum

Microwave	Infra-red	Visible light	A	X-ray

Name part labelled A (1mark)

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SECTION B (55MARKS)

Answer ALL questions in the space provided

15. a) Figure 7 below shows a positively charged electroscope. A positively charged rod was brought near the cap. Explain the observation (2marks)

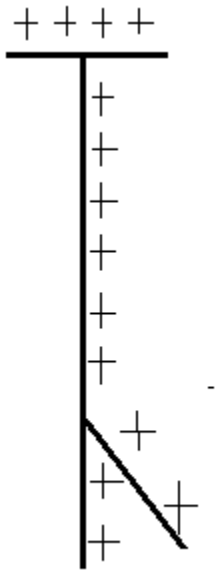

figure 7

b) i. Define capacitance (1mark)

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ii. Explain how the capacitance of a parallel plate capacitor can be increased (2marks)

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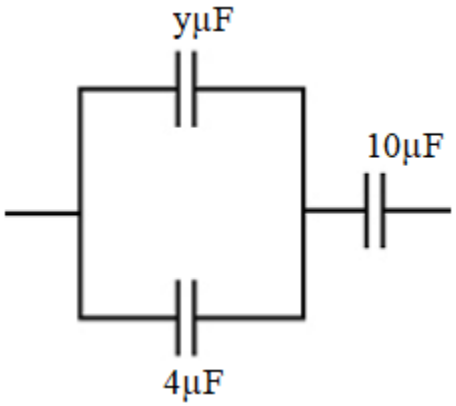
b) Figure below shows an arrangement of capacitors with effective capacitance of 5µF



Calculate the value of y in Farads. (3marks)

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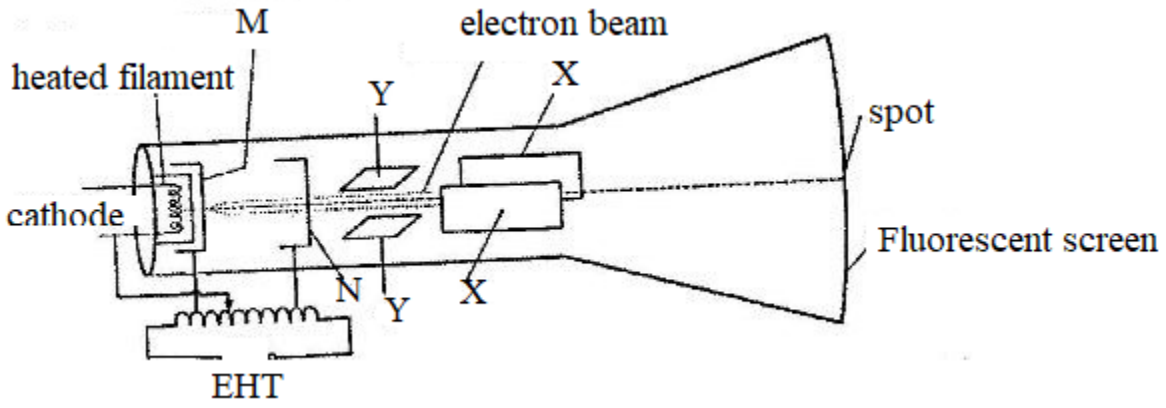
c) Figure below shows the main features of a cathode ray oscilloscope (CRO).



i. Name the parts labelled M& N (2marks)

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ii. Explain how electrons are produced in the tube (2marks)

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iii. State why the tube is highly evacuated (1mark)

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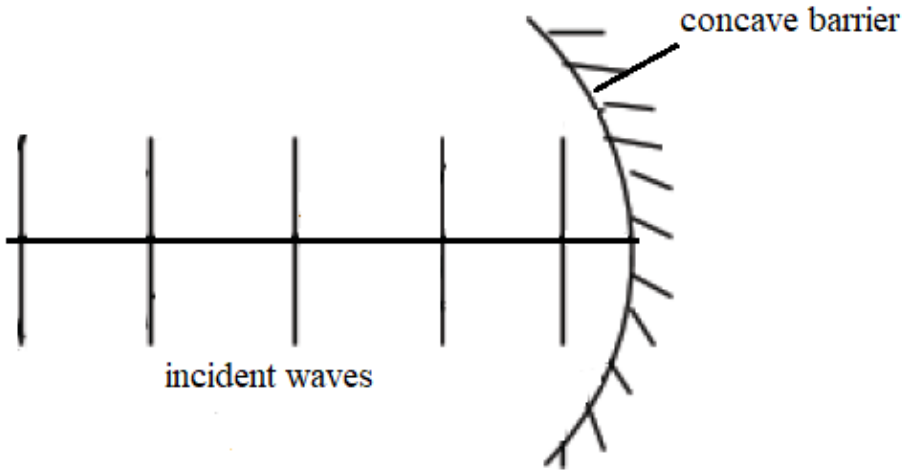
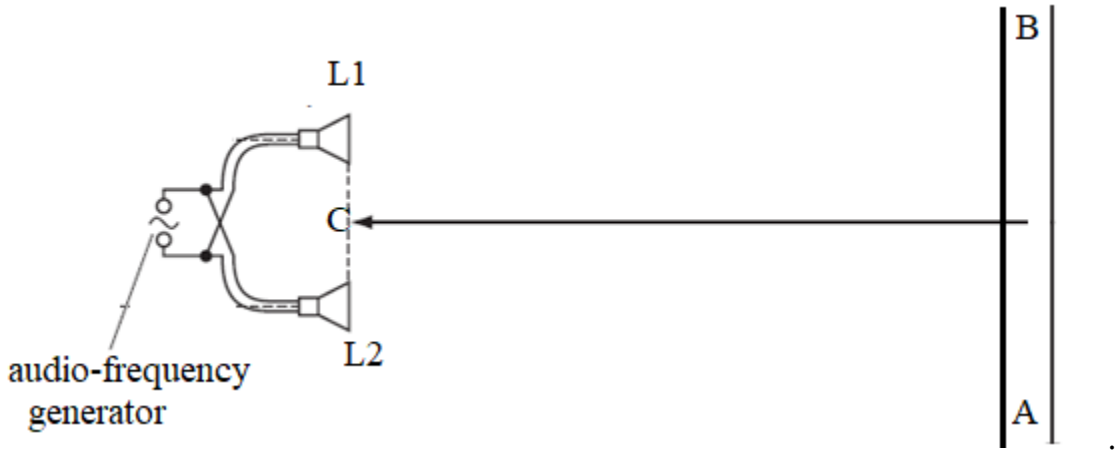
16. a) The figure below shows two straight waves incident on a concave barrier. Complete the diagram above showing how straight waves behave after reflection from a concave barrier (2marks)



b) Figure below shows two loud speakers L1 AND l2 connected to a common signal generator (SG). The two loud speakers L2 and L2 act as coherent sources of sound



i) What is the meaning of the term coherent source of sound. (1mark)

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ii) State and explain the observation made by a person walking along the line AB (2marks)

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c) Figure below shows A wave produced at end and travels towards B

The wave is reflected by B (barrier) and travels back towards A. The two waves (incident and reflected) superimposed to form a stationary (standing0 wave. On the figure, draw the reflected wave and on it indicate positions of nodes (N) and antinodes (A). (3marks)

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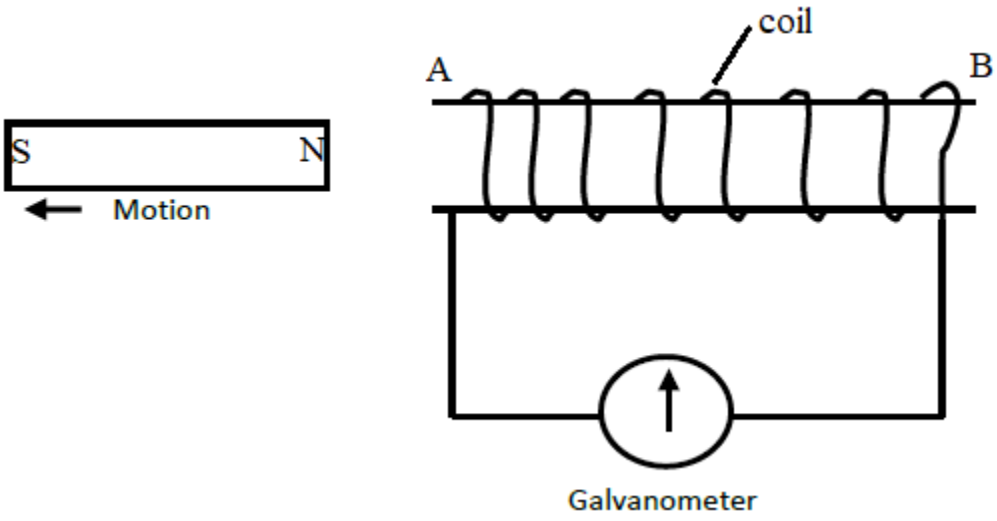
17. a) Figure below shows a magnet placed near a coil AB. The coil is connected to a centre 0 galvanometer (G)



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i. State with a reason the observation made when the magnet is moved away from the coil as shown (3marks)

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ii. State what will be observed when the experiment is repeated but with the magnet nearest to the coil end A (1mark)

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iii. Explain the change that will be observed if the speed at which the magnet is moved away from the coil is increased (2marks)

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b) A transformer is designed to step down voltage from 240V to 12V. Determine the number of turns in the secondary coil if it has 1200 turns in the primary coil (2marks)

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c) Show that photoelectric effect will not occur if an electromagnet radiation of frequency 7.7×10^{14} Hz is incident on a metal surface whose work function is 5.2×10^{-19} J (take planks constant $=6.63\times10^{-34}$JS (3marks)

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18. a) i. Define electric current (1mark)

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i. If a charge of 30μC is made to flow through a conductor in 2 hours what is the current flowing (3marks)

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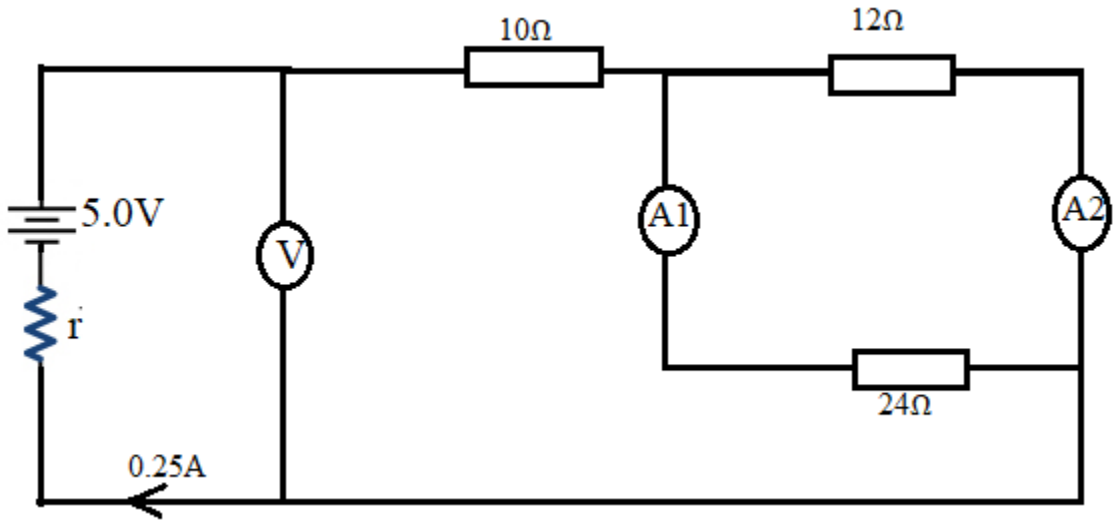
b) The figure below shows a circuit powered by a battery of e.m.f 5.0 volts with internal resistance r. It also contains load resistances, 10Ω, 12Ω and 24Ω. V is a voltmeter while A_1 and A_2 are ammeters.



Total amount flowing is 0.25A as shown. Determine

i. Reading of V (3marks)

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ii. Reading of A_1 (2marks)

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iii. value of r (2marks)

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c) A single room has three bulbs each rated 60W. The bulbs are lit for 10 hours per day.

Determine the cost of lighting the bulbs for 30 days (1KWh costs Ksh.3 (2marks)

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19. a) i. Draw and name the three types of curved mirrors (3marks)

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ii. Use ray diagram on anyone of the mirrors to show what is meant by principal focus (2marks)

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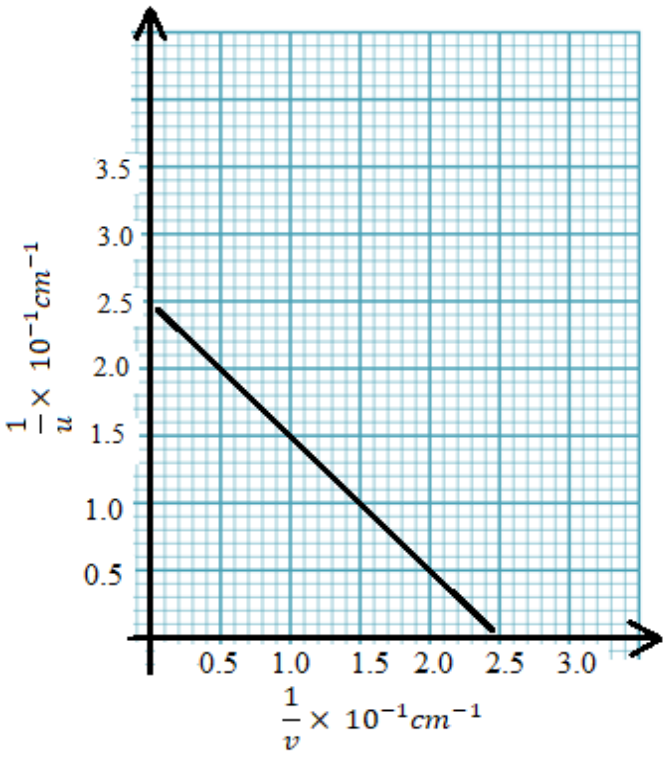
b) The graph below shows values of 1/v and 1/u plotted on a graph in an experiment to determine the focal length of a convex lens



i. Sketch an experimental set up of apparatus that can be used to obtain data which when plotted will yield similar results (2marks)

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

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