NAME.....INDEXNO.....ADM NO.....

SCHOOL.....SIGN.....DATE.....

ACK MASENO WEST JOINT EXAMINATION

KENYA CERTIFICATE OF SECONDARY EDUCATION

232/2 - PHYSICS - Paper 2

MARCH 2025 – 2 HOURS

FORM FOUR

Instructions to candidates

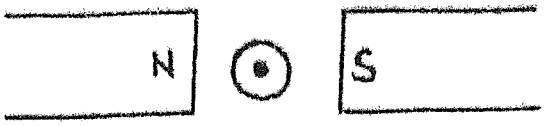
(i) This paper consists of two sections *A* and *B*.
(ii) Answer **all** the questions in the two sections in the spaces provided after each question
(iii) All working **must** be clearly shown.
(iv) Electronic calculators and Mathematical tables may be used.
(v) All numerical answers **should be expressed** in the **decimal** notations.
(vi) ***This paper consists of 13 printed pages.***
(vii) ***Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.***
(viii) ***Candidates should answer the questions in English.***

FOR EXAMINERS' USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
SECTION A	1-15	25	
SECTION B	16	14	
	17	12	
	18	13	
	19	09	
	20	07	
	TOTAL	80	

SECTION A (25MARKS)

1. The diagram below shows a cross – section of a conductor carrying current and held between 2 poles of a magnet.



Using an arrow, indicate the direction in which the conductor will move when it is released (1mk)

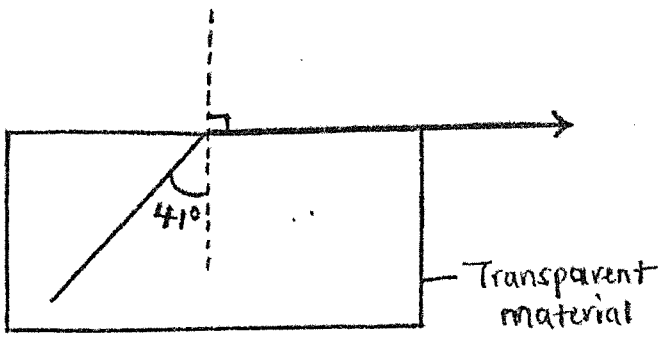
2. a) Briefly explain what is meant by critical angle (1mk)

.....

.....

.....

b) The figure drawn shows a path of ray of light through a transparent material placed in air



Determine the refractive index of the transparent material. (3mks)

.....

.....

.....

.....

.....

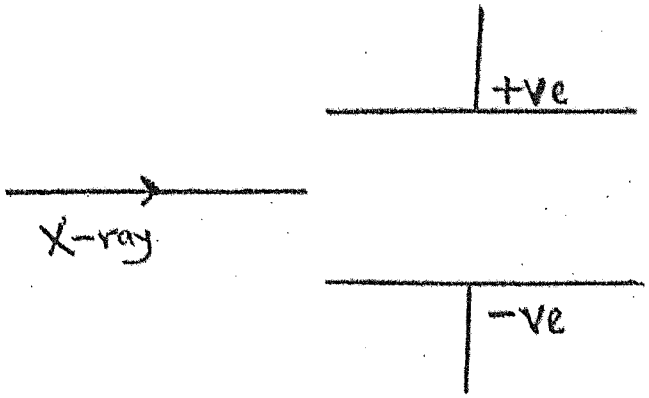
3. Secondary cells are often preferred to primary cells in most electrical gadgets. Justify this statement (1mk)

.....

.....

.....

4. Drawn is an x – ray radiation made to pass through two electrodes as shown.



Complete the path of the radiation and explain why it is so. (2mks)

.....

.....

.....

.....

5. An electric heater with a resistance of 100Ω is connected to a 240V main supply. Determine the heat energy dissipated in 2 minutes. (3mks)

.....

.....

.....

.....

.....

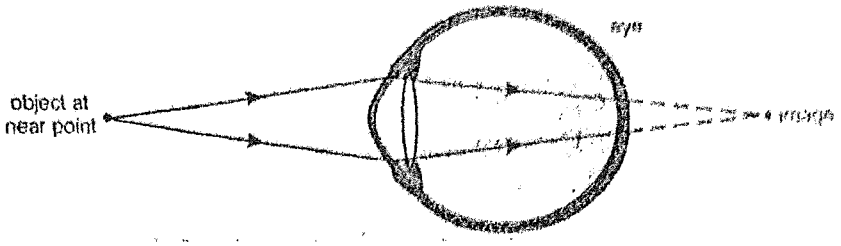
.....

6. State any one use of a gold leaf electroscope.(1mk)

.....

.....

7. The figure drawn shows lights rays entering a human eye.



a) Identify the defect drawn (1mk)

.....

.....

.....

b) State any possible cause of the defect (1mk)

.....

.....

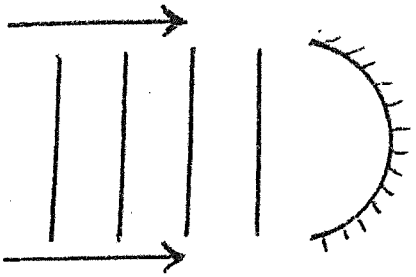
8. Apart from bulbs operating independently, state one other advantage of connecting bulbs in parallel in domestic wiring (1mk)

.....

.....

.....

9. The figure below shows straight wave fronts approaching a concave reflector.



a) Complete the diagram using dotted lines to show waves formed after reflection (1mk)

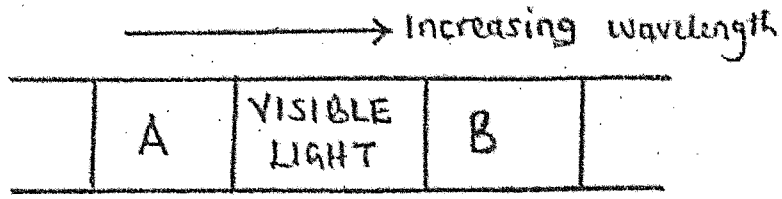
b) Name the other wave characteristic apart from frequency which remains constant after reflection (1mk)

.....

.....

10. Sketch a circuit of 3 capacitors and a cell from a set of 1.0 uF, 2.0 uF and 3.0 uF such that the net capacitance in the circuit is 1.5uF(2mks).

11. The table drawn shows an arrangement of electromagnetic radiations in order of increasing wavelength.



Identify the radiations A and B(2mks)

A=

B=

12. Briefly describe one main structural difference between an AC generator and a d.c generator.(1mk)

.....

.....

.....

13. Name one property of cathode rays which shows that they have a particulate nature. (1mk)

.....

.....

.....

14. Fleming's left hand rule is often used to predict the direction of motion of a conductor. Name the physical quantity predicted by the Dynamo Rule. (1mk)

.....

.....

.....

15. Briefly explain any property of magnetic field lines. (1mk)

.....

.....

.....

SECTION B (55 MARKS)

16. a) Differentiate between step – down and step– up transformer. (1mk)

.....

.....

.....

b)Commercial transformers do not operate at 100% efficiency. Name two forms of energy losses in a transformer that justifies the statement.(2mks)

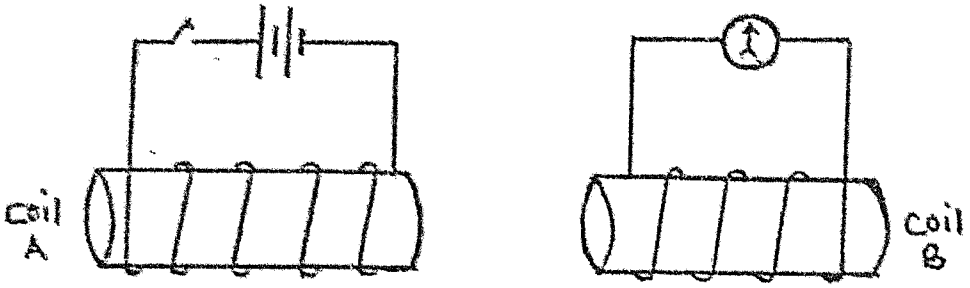
.....

.....

.....

.....

c)The diagrams drawn shows 2 coils adjacent to each other used in inducing an Emf through mutual induction



Show on coil B the direction of current when the switch is closed. Also state the direction of deflection on galvanometer (2mks)

d)A transformer that is 80% efficient has 4000 turns in the primary coil and 500 turns in the secondary coil. It is used to supply power to a 15Ω motor from a 240V mains.

i. Calculate the voltage in the secondary coil. (3mks)

.....

.....

.....

.....

ii. Work out the power rating of the motor(3mks)

.....

.....

.....

.....

.....

iii. Determine the current in the primary coil (3mks)

.....

.....

.....

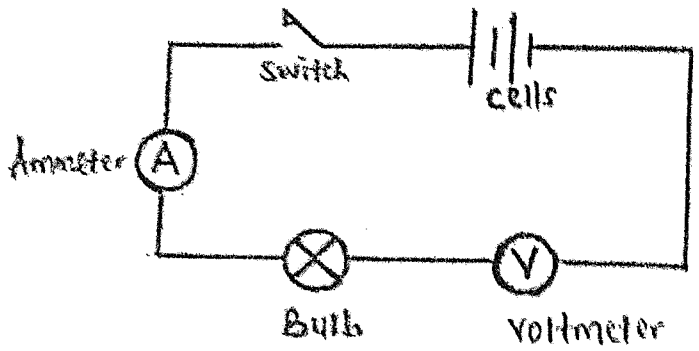
.....

17. a)Apart from physical factors state any other factor which affects Ohm's law.(1mk)

.....

.....

b)The circuit below was drawn by a group of students during a class experiment to investigate current – voltage characteristics of a torch bulb



Identify any 2 mistakes made by the students in drawing the circuit.(2mks)

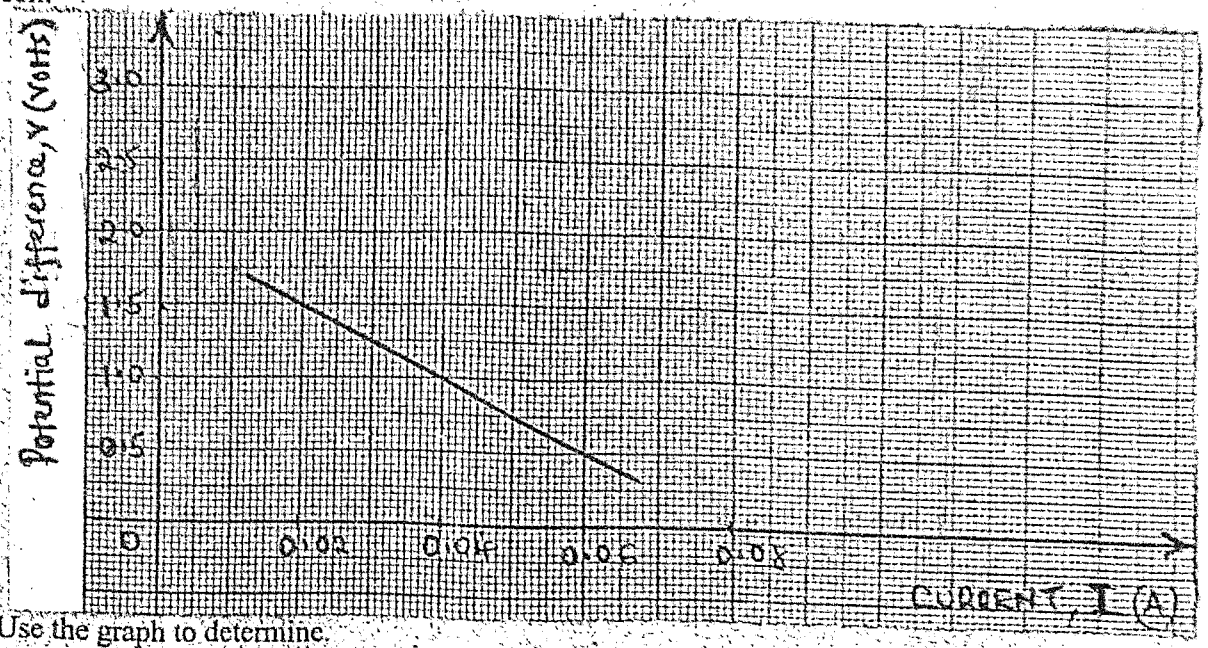
.....

.....

.....

.....

c)The graph drawn shows a variation of potential difference, V with current I for a certain cell.



Use the graph to determine.

i) The internal resistance of the cell. (4mks)

.....

.....

.....

.....

.....

ii) The e.m.f of the cell.(2mks)

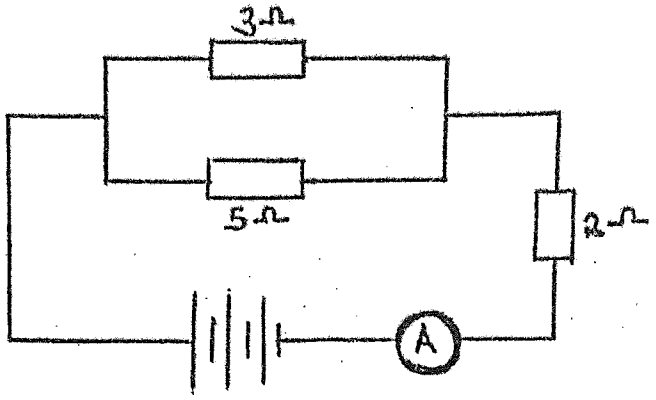
.....

.....

.....

.....

d)The diagram below shows a set of resistors connected to a 4.5V source and an ammeter.



Given that the internal resistance of each cell is 0.1Ω, determine the ammeter reading. (3mks)

.....

.....

.....

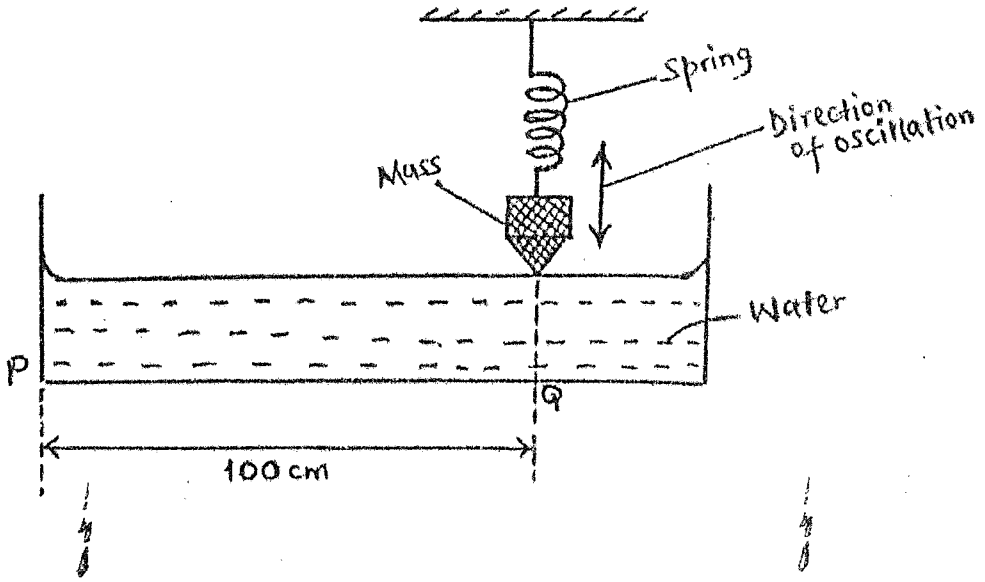
.....

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

.....

.....

b)Some students set up a mass attached to a spring such that when it oscillates, it touches the surface of water in some wide shallow tank as shown.



During the oscillation of the mass, the students measured time for 10 oscillations and discovered that it took the mass 25seconds.

i) Determine the periodic time of the mass (2mks)

.....

.....

.....

.....

ii) Calculate the frequency of the waves produced on the water surface.(2mks)

.....

.....

.....

.....

iii) As the mass oscillated touching the water surface, students counted 5 ripples between the points Q to P. Determine the speed of the waves. (3mks)

.....

.....

.....

.....

.....

c) Determine the resultant amplitude for two waves out of phase if one wave has an amplitude of 1.0cm and the other 3cm (2mks)

.....

.....

.....

.....

From the diagram

i) Work out the effective capacitance for the arrangement .(3mks)

.....

.....

.....

.....

ii) Determine the charge stored on the 6uF capacitor. (3mks)

.....

.....

.....

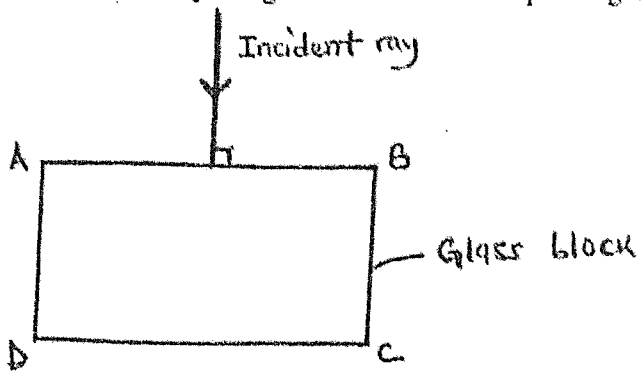
.....

20. a) State Snell's law (1mk)

.....

.....

b)The diagram drawn shows a ray of light incident on a transparent glass block as shown



i) State whether or not the ray will undergo refraction. Justify your answer.(2mks)

.....

.....

.....

.....

ii) Complete the ray diagram until it emerges on the face CD.

c) A ray of light is incident on a transparent material as shown.

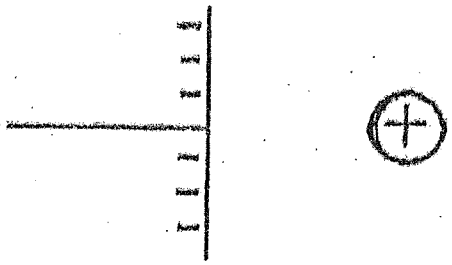
d) A man standing between 2 tall walls claps his hands. He hears the first echo after 2.5 seconds and the second echo is heard 1.5 seconds later. If he is 660m from the farthest wall, determine the speed of sound in air. (3mks)

.....

.....

.....

19. a) Drawn is a positive point charge put close to a negative plate



Sketch the resultant electric field pattern (1mk)

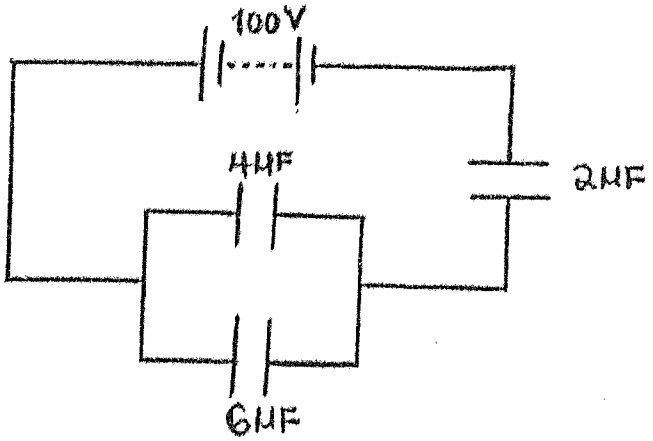
b)State 2 uses of capacitors (2mks)

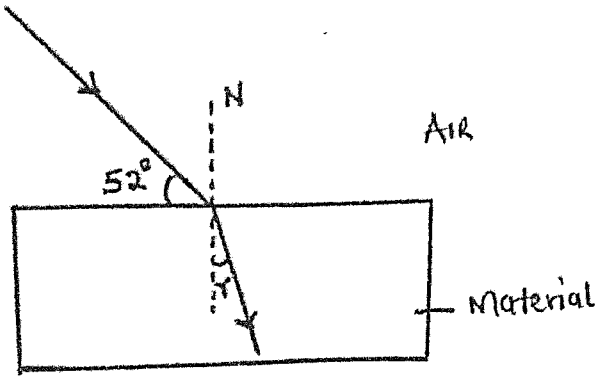
.....

.....

.....

c)Study the diagram drawn and use it to answer the questions that follow.





If the refractive index of the material is 1.48, determine the angle of refraction, r (3mks)

.....

.....

.....

.....