

FORM FOUR EVALUATION TEST

END OF 2nd TERM – 2018

PHYSICS 232/2

PAPER 2 EXAMINATIONS

TIME: 2 hrs

NAME: _____ ADM.NO: _____ CLASS: _____

INSTRUCTIONS TO CANDIDATES.

- 1) This paper consists of two sections: A and B.
- 2) Answer all the questions in section A and B in the spaces provided.
- 3) All working must be clearly shown.
- 4) Mathematical tables and electronic calculators may be used.
- 5) Candidates should answer the questions in English.

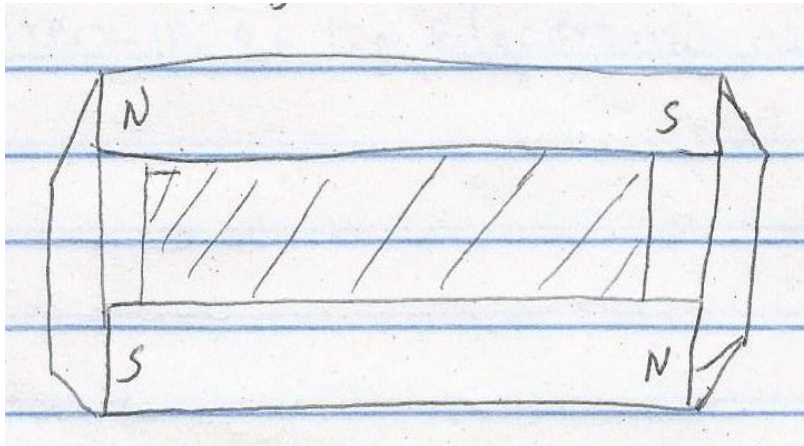
FOR EXAMINER'S USE ONLY.

SECTION	Question	Candidates score
A	1 – 14	25
B	15	12
	16	11
	17	11
	18	11
	19	10
Total		80

SECTION A:

(25MKS)

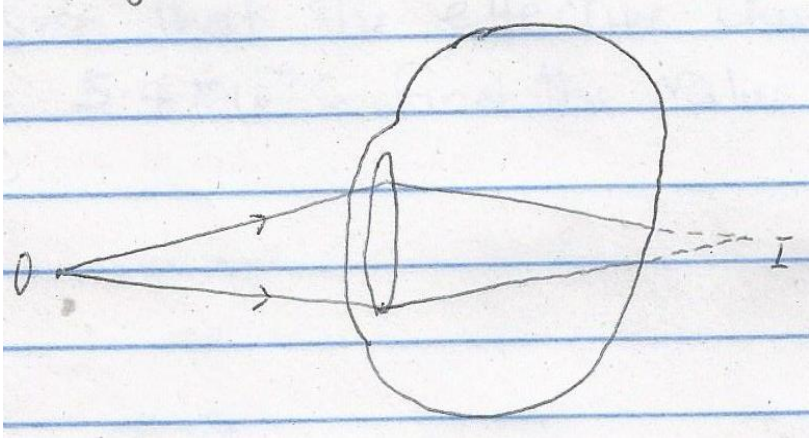
1. Five images are formed when two mirrors are inclined at an angle between them. Determine the angle of inclination. (2mks)
2. Explain why theatre halls are cautioned with soft materials. (2mks)
3. Magnets are stored in pairs with unlike poles adjacent, and with keepers at the ends with a non magnetic material between.



- a) What is the purpose of
 - a) The non - magnetic material (1mk)
 - b) The keepers (1mk)

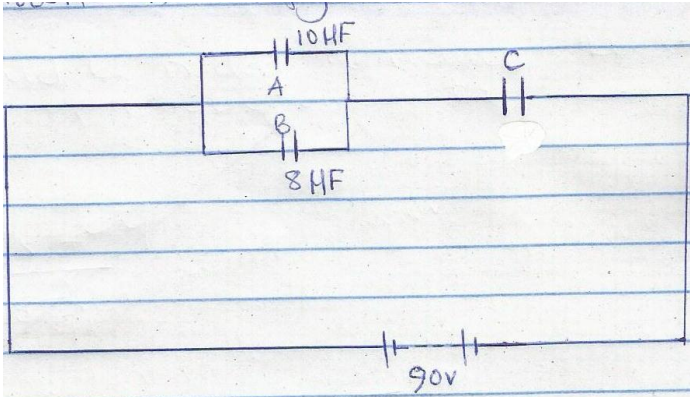
4. Give one advantage of using dry cell over an accumulator. (1mk)
5. An electromagnet is made by winding insulated copper wire on an iron core. State two changes that could be made to reduce the strength of the electromagnet. (2mks)
6. What is meant by a virtual image? (1mk)
7. Draw a circuit to show a formal biased pin function connected to a battery. (1mk)
8. Explain the fact that radiant heat from the sun penetrates a glass sheet while radiant heat from burning wood is cut off by the glass sheet. (2mks)
9. What is the use of a low voltage source in a cathode ray tube? (1mk)

10. The figure below shows an eye defect.



Draw another diagram to show how the defect is corrected.

11. Three capacitors A, B and C are connected as shown in the figure below.



Given that the effective charge for the system is $5.4 \times 10^{-4} \text{C}$. Find the value of the capacitance for C. (3mks)

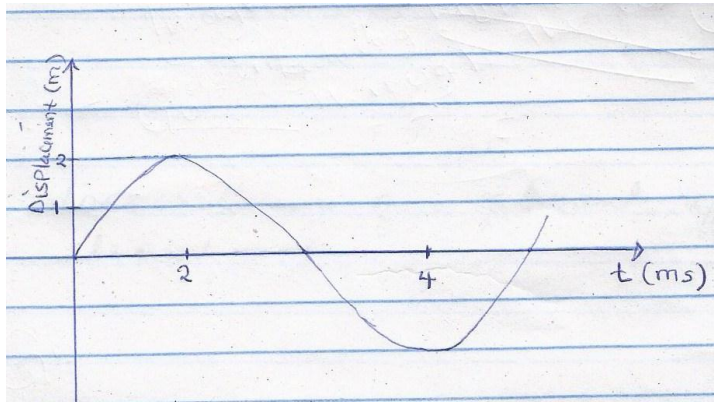
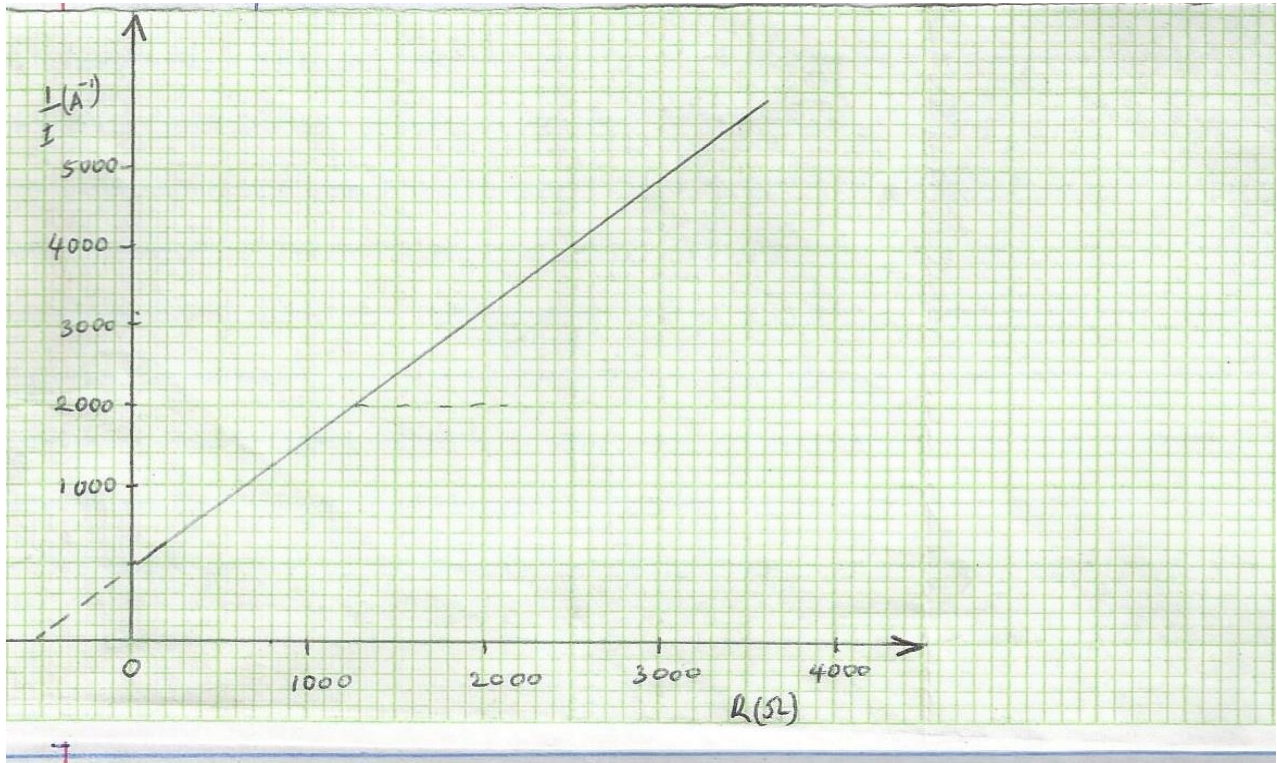


Figure for question 12.

12. The figure above is an illustration of a wave pattern. Calculate the frequency of the wave given that the velocity of the wave is 8m/s . (2mks)
13. In an experiment to determine the E.m.f of a cell the student obtained the graph below.



Calculate the E.m.f

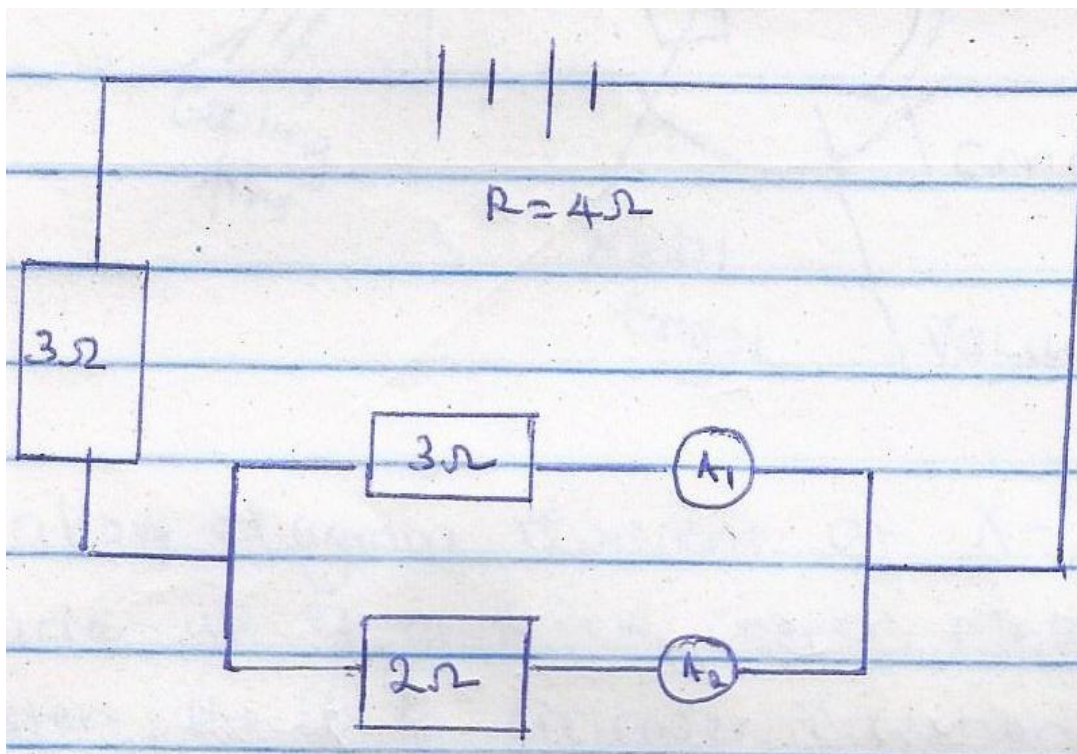
(3mks)

14. How does resistance of a filament affect heating of an element? (1mk)

SECTION B: _____ (55 marks)

15. a) Define electromotive force of a cell. (1mk)

b) Study the circuit below and answer questions (i) and (ii) that follow.



Given that the total current in the circuit is 12A, determine.

i) The E.m.f of the battery (3mks)

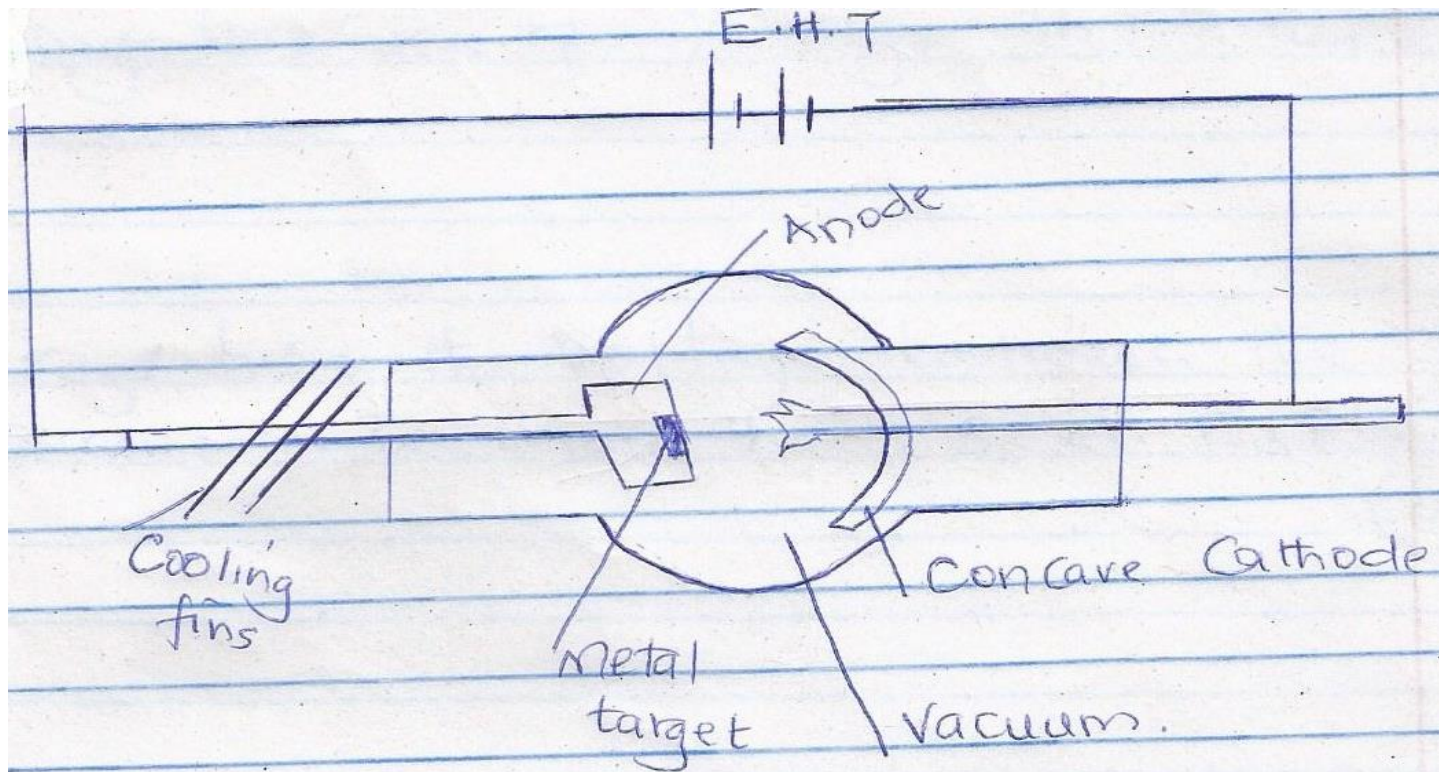
ii) The ammeter readings A_1 and A_2 (3mks)

c) An electric heater is made of a wire of resistance 100 ohms and connected to a 240V mains supply. Determine the:-

i) Power rating of the heater. (3mks)

ii) Current flowing in the circuit. (2mks)

16.

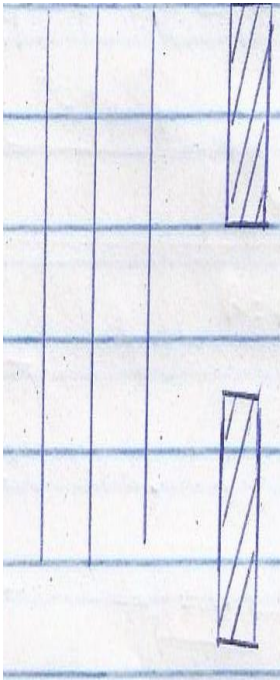


The above diagram represents an X – ray tube. The anode is made up of a thick copper metal which is embedded tungsten; use it to answer questions that follow.

- a) i) Why is it necessary to maintain a vacuum inside the tube. (1mk)
- ii) Why is anode made of a thick copper metal? (1mk)
- iii) What effect will increase in p.d between the anode and the filament have on the X – ray produced. (1mk)

- b) i) Why are cooling fins necessary? (1mk)
- ii) State any two uses of x-rays in medicine. (2mks)
- c) In X-ray tube the voltage between the cathode and the anode is more than 50kv. Explain. (1mk)
- d) An X-ray tube operates with a potential difference of 250kV between the cathode and the anode. Only 0.5% of the Kinetic energy of each electron is Converted into x-rays. (Take electron charge, $e = 1.6 \times 10^{-19}\text{C}$)
- i) Kinetic energy of each electron. (2mks)
- ii) Energy of the X-rays. (2mks)
17. a) Define diffraction as applied in waves. (1mk)

- b) The diagram below shows wave fronts approaching an opening.

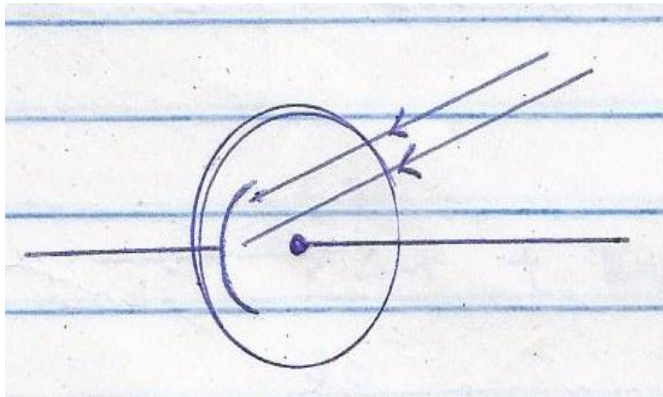


- i) Sketch the wave-front after passing the opening, on the same Diagram. (1mk)
- ii) State what would be observed on the pattern after passing the Opening if:
- i) The gap was made smaller. (1mk)
- ii) The wavelength was made larger. (1mk)
- c) When a metre rule was placed in a ripple tank, it was noted that the distance between 15 successive dark lines (crests) was 30cm. The frequency of the vibrator was 20HZ. Determine:
- i) One wave length of the waves in the ripple tank. (2mks)

ii) The periodic time of the wave. (2mks)

iii) The velocity of the waves over the water surface. (3mks)

18. a) The figure below shows a photo cell.



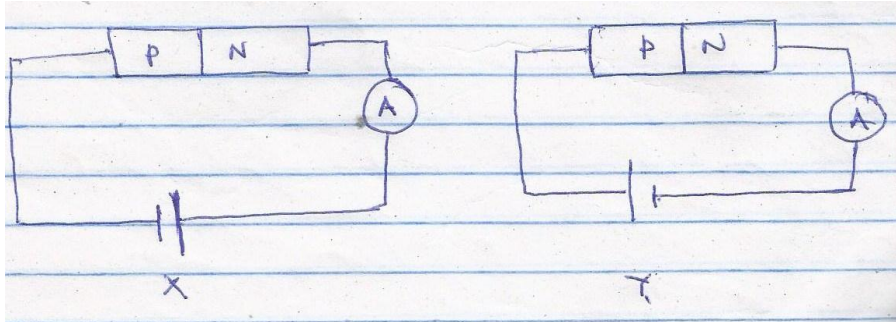
i) Label the cathode and anode. (1mk)

ii) How are electrons produced in the cell? (2mks)

iii) On the diagram, show the direction of the current. (1mk)

iv) Calculate the photon energy in ultraviolet radiation whose frequency is 8.60×10^{14} Hz (planks constant $h = 6.63 \times 10^{-34}$ Js) (3mks)

- v) The figure below shows two ways of biasing a P-N junction.



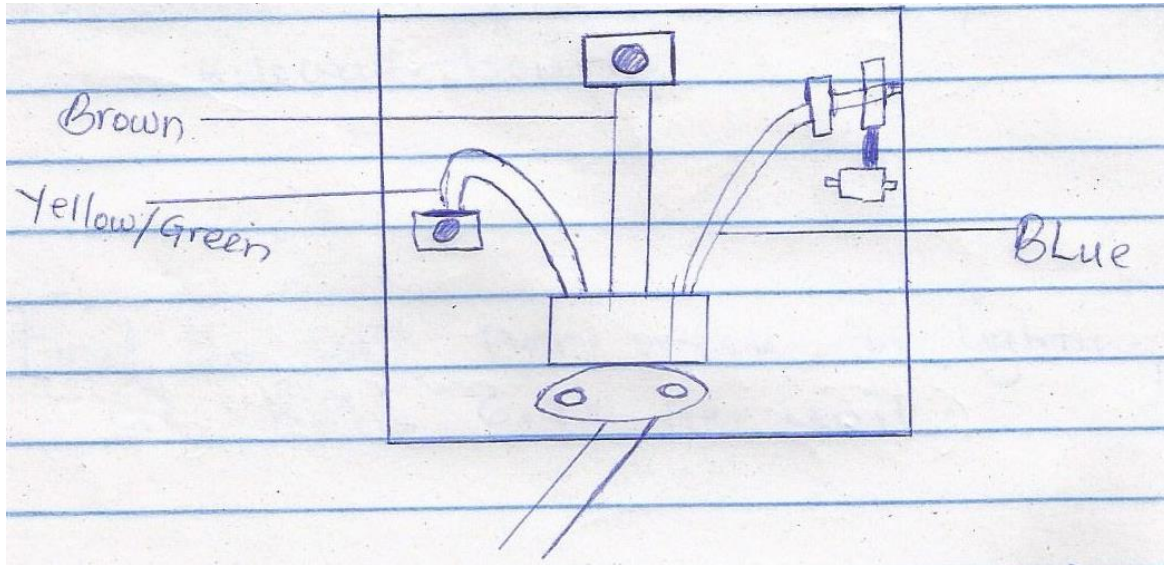
State in which of the circuits will current flow. Explain (2mks)

- vi) A radioactive isotope of copper decays to form an isotope of zinc as shown below.



Name the radiation emitted and state one of its characteristics (2mks)

19. a) The figure below shows a connection of the three pin plug.



- i) Identify two mistakes in this wiring. (2mks)
- ii) What would happen if this plug was connected to the mains of the socket? (1mk)
- iii) State two reasons why the earth pin is normally longer than the other two pins. (2mks)

b) A house had five rooms with 240V, 75W bulbs. If the bulbs are switched on from 7:00pm to midnight.

i) Calculate the power consumed per day in kilowatt – hour.
(3mks)

ii) Find the cost per week for lighting these rooms at Kshs. 6.70 per unit.
(2mks)

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