

232/2
PHYSICS
Paper 2
2 hours

STRATHMORE SCHOOL
MOCK EXAM

INSTRUCTIONS TO CANDIDATES.

1. Write your name and index number in the spaces provided above.
2. Sign and write the date of examination in the spaces provided above.
3. This paper consists of **TWO** sections: A and B.
4. Answer **ALL** the questions in sections A and B in the spaces provided.
5. All working **MUST** be clearly shown
6. Mathematical tables and electronic calculators may be used.

Take: Acceleration due to gravity $g=10\text{m/s}^2$

FOR EXAMINER'S USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
1	1 - 13	25	
2	14	12	
	15	9	
	16	11	
	17	10	
	18	8	
	19	5	
TOTAL		80	

This paper consist of 8 printed pages

Candidates should check the questions paper to ensure that all the pages are printed as indicated and no questions are missing.

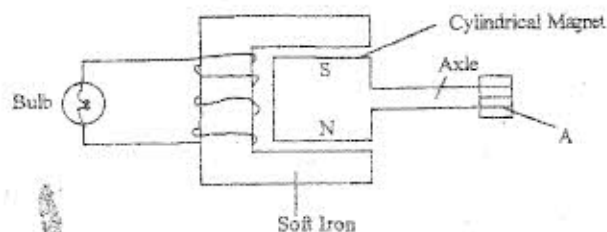
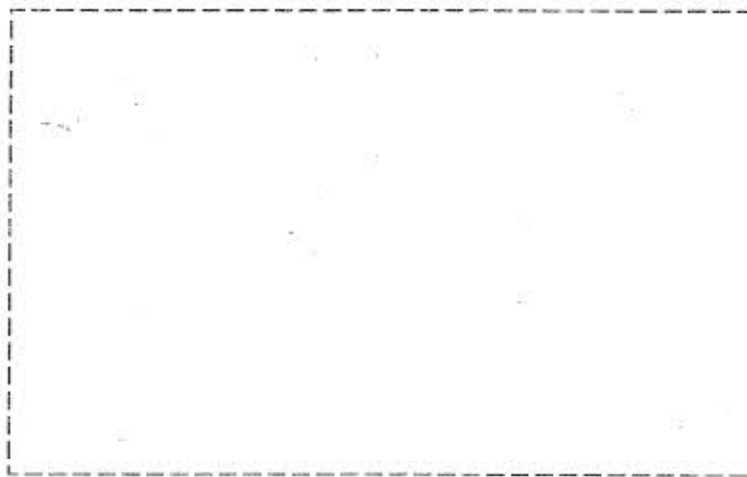
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SECTION A (25 marks)

Answer all questions in the spaces provided.

1. A battery drives a steady current of 2.5A for 1.5 minutes. Calculate the quantity of charge passed through the wire in that time. (2 marks)

2. Draw a ray diagram to show how a concave mirror can give a virtual image. (for your answer use the dotted space provided) (2 marks)



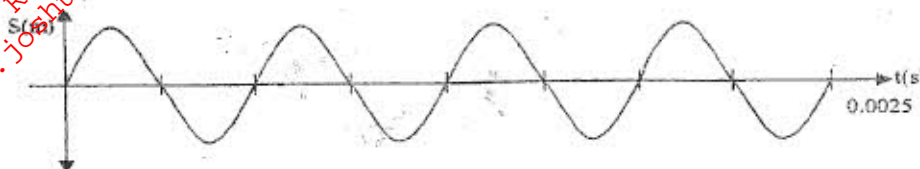
3. A diagram of a bicycle dynamo is shown above. Wheel A is connected by an axle to a permanent cylindrical magnet and is rotated by the bicycle tyre. Explain why the bulb lights. (2 marks)
4. State **ONE** condition for a ray of light to undergo total internal reflection. (1 mark)
5. Define the terms **Work function** and **Threshold frequency** of a metal surface. (2 marks)

11. With the help of a diagram explain short sightedness and its correction.

(2 marks)

12. The sketch diagram shows a displacement-time graph of a wave travelling at 320 m/s. Find the wavelength of the wave.

(3 marks)



13. State two uses of microwaves.

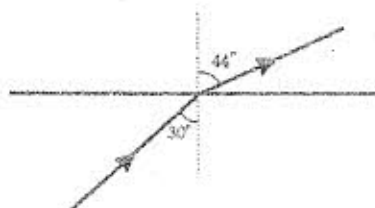
(1 mark)

SECTION B (55 marks)

Answer all questions in the spaces provided.

14. (a) The diagram represents a ray of light passing from a liquid into air. Calculate the refractive index of the liquid.

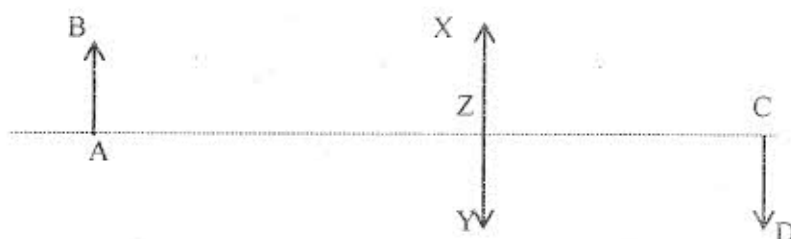
(3 marks)



(b) You are provided with a plane mirror, a soft board and three optical pins. Using a diagram describe an experiment to verify the laws of reflection of light.

(3 marks)

(c) A convex lens forms an image CD of an object AB which is placed some distance on one side of the lens.

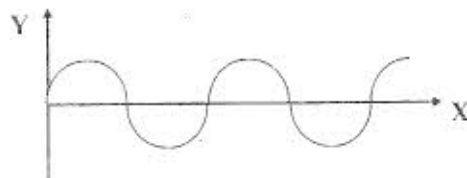


i) Explain how you would find the focal length of the lens using the information supplied by the diagram

(2 marks)

- ii) Show how the rays AX, AY and AZ behave after they have passed through the lens. Now repeat the exercise for the rays BX, BY and BZ. (Use the diagram above) (2 marks)
- iii) If the lens was replaced by one of a smaller focal length, what effects would this have on the position and size of the image? (2 marks)

15. (a) i) What is a longitudinal wave?



(1 mark)

- ii) Sound, as a wave, is often represented as in the diagram shown. What quantity could be on the y-axis? (1 mark)
- iii) The frequency of a source of sound is increased. What is the effect on the pitch of the note? (1 mark)

b) Briefly describe how you would determine the speed of sound in air by any one method. (3 marks)

(c) Waves in a ripple tank have a frequency 10Hz and are travelling in deep water where their speed is 0.30m/s. They then enter shallow water where their speed is only 0.20 m/s. Calculate:

- i) Their frequency in the shallow water. (1 mark)
- ii) The wavelength in the shallow water. (2 marks)

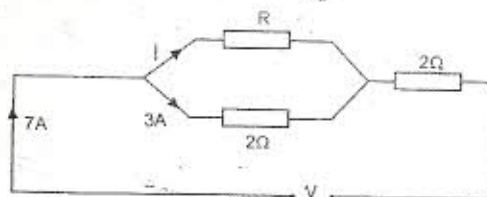
16. (a) i) Define the Ohm as a unit of resistance.

(1 mark)

ii) Give an example of an ohmic device.

(1 mark)

(b) The figure below shows an electric circuit.



Determine:

i) I

(1 mark)

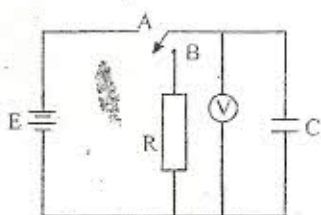
ii) R

(2 marks)

iii) V

(2 marks)

(c) Explain how capacitor C in the diagram is;



i) charged

(2 marks)

ii) discharged

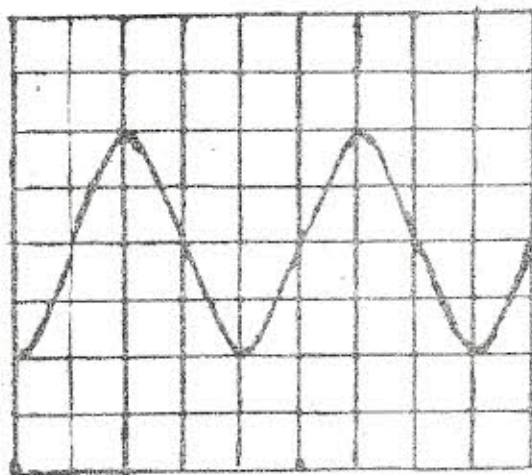
(2 marks)

17. (a) What is Thermionic emission?

(1 mark)

(b) The figure below represents a cathode ray beam passing between pole pieces of a permanent magnet.

Explain the path followed by the electrons and give reasons for your answer. (2 marks)



(c) The wave form shown is a display of an a.c. signal on the CRO screen with a grid in cm.

i) Determine the frequency, given that the time base is set at 500 ms/cm (2 marks)

ii) The peak value of the a.c. given that the Y-gain is set at 100V/cm (1 mark)

(d) Draw a labelled diagram of a CRO tube. (4 marks)

18. (a) You are provided with a photocell, a milliammeter, a dc power supply, a source of light and connecting wires. Draw a labelled diagram and use it to explain the photoelectric effect.

(3 marks)

(b) Light from ultra violet lamp is used to knock electrons off a zinc plate. The fastest electrons are found to move at 1.0×10^5 m/s. What will be the effect on this speed by:

(i) making the light dimmer.

(1 mark)

(ii) using light of a shorter wavelength.

(1 mark)

(c) Rubidium has threshold frequency of 5.0×10^{14} Hz. Calculate the maximum kinetic energy of the electrons ejected by incidence of light of frequency 8.0×10^{14} Hz. ($h = 6.63 \times 10^{-34}$ Js)

(3 marks)

19. (a) A physicist wanted to study the X-rays emitted by an X-ray tube.

i) State one precaution he should take while working with the X-ray tube.

(1 mark)

ii) Suggest how the physicist would determine the frequency of the X-ray photons emitted.

(2 marks)

iii) Give one use each for hard and soft X-rays.

(2 marks)