

Name.....index no.....Ad.no.....Class.....

Alliance High School

Pre -trial Exams

Physics Paper 2

232/2

Time: 2:00 hours

Instructions to candidates

Attempt all questions in the spaces provided.

All working must be shown.

Answers to numerical questions must be expressed in decimal form.

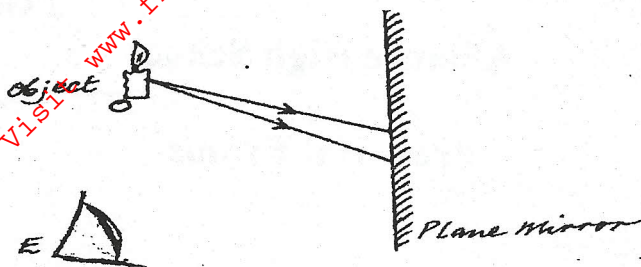
This paper consists of two sections.

Question	Maximum Score	Candidate's Score
1 - 10	25	
11	10	
12	10	
13	11	
14	7	
15	11	
16	7	

This paper consists of 9 typed pages

SECTION 1 (25 MARKS)

1. The figure below shows an object O placed in front of a plane mirror.



On the same diagram, draw rays to locate the position of the image I, as seen from the eye, E. (3mks)

2. The figure below shows a point negative charge close to a metal plate. Sketch the electric field pattern. (2mks)

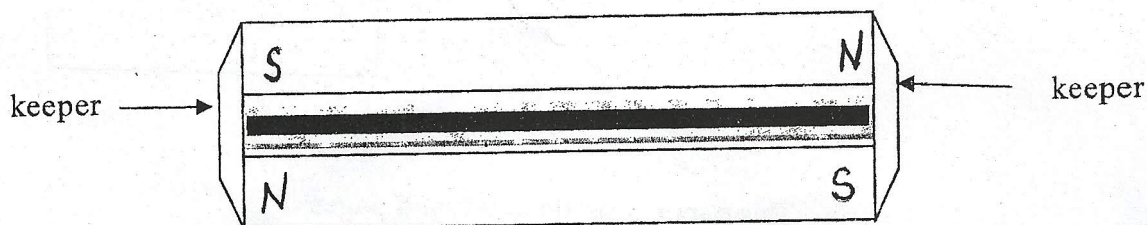


3. Two filament bulbs connected in series with a battery of two dry cells and a switch initially light brightly. (1mk)

(a) State the reason why the light dims gradually.

(b) Explain why the bulbs again shine brightly after the circuit is switched off for some time. (2mks)

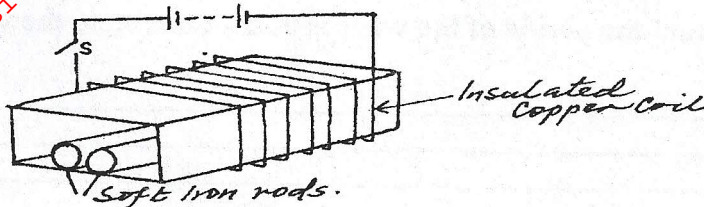
4. The figure below shows how magnets are stored in pairs between keepers.



Explain how this method of storing helps in retaining magnetism longer.

(2mks)

5. Two soft iron rods are placed inside a cardboard box that has a coil of insulated copper wire around it connected to a battery as shown in the figure below.



State and explain what happens to the rods when the switch is closed.

(2mks)

6. Light of frequency 5.5×10^{14} Hz is shone on a metal surface whose work function is 2.5 eV.

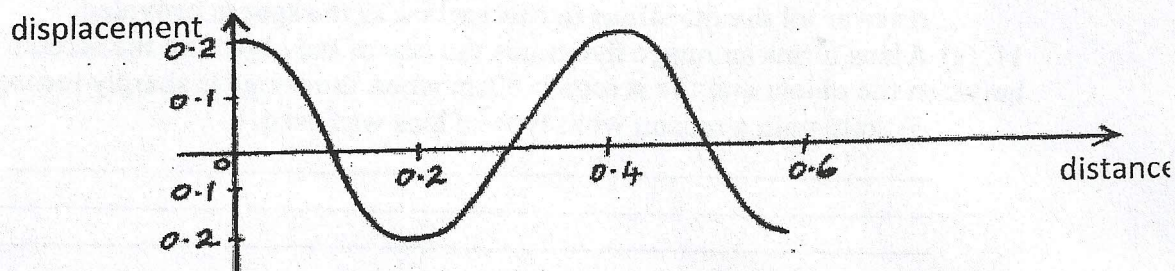
Show that photoelectric effect will not take place. (Planck's constant $h = 6.63 \times 10^{-34}$ JS, charge on an electron $e = 1.6 \times 10^{-19}$ C).

(3mks)

7. A girl stands 85m from a high building and claps her hands once every second. She hears an echo mid-way between it and the next clap. Calculate the speed of sound.

(2mks)

8. The figure below shows a displacement-distance graph of a wave profile.

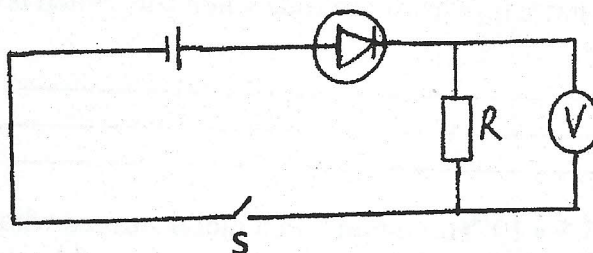


(a) State the amplitude of the wave.

(1mk)

(b) Given that the period of the wave is 0.25s, determine the velocity of the wave.
(2mks)

9. In the figure below, the voltmeter shows a reading when the switch S is closed.



State and explain the observation made when the terminals of the cell are reversed.
(2mks)

10. The initial mass of a radioactive sample is 80g. The mass remaining after 25 years is 5g.

Calculate the half-life of the sample. (3mks)

SECTION B: (55 MARKS)

Answer all the questions in this section in the spaces provided.

11. (a) A lens forms an image five times the size of the object on the screen. The distance between the object and the screen is 60cm when the image is sharply focused.

(i) State with a reason what type of lens was used. (2mks)

(ii) Determine:

(i) The object distance.

(2mks)

(ii) The image distance.

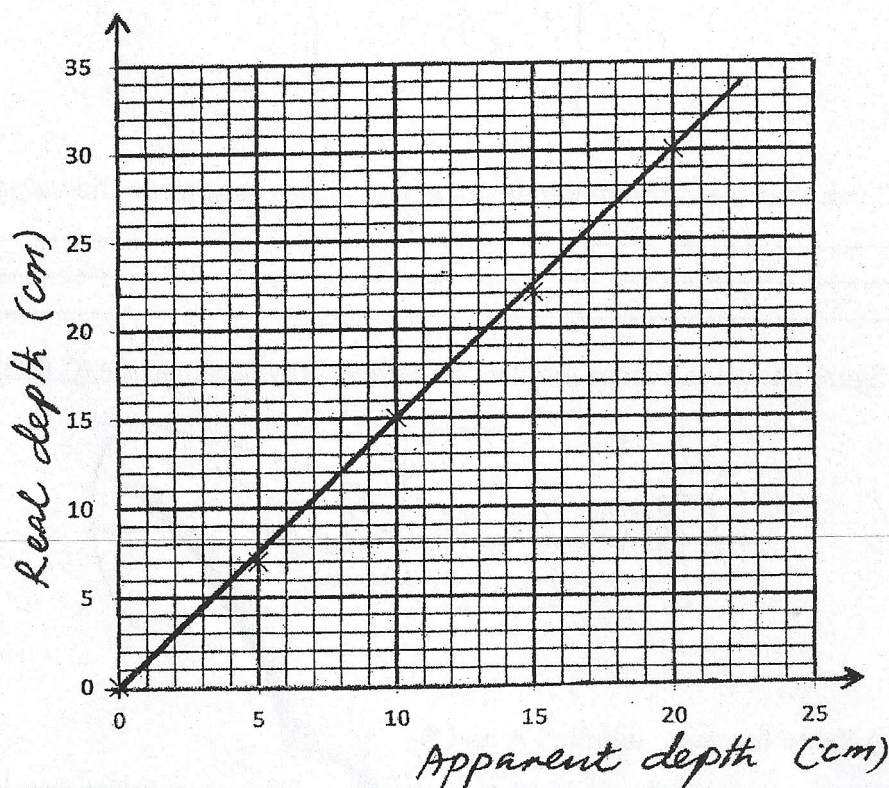
(2mks)

b). State two similarities and two differences between the human eye and a camera. (4mks)

12. (a) State Snell's law.

(1mk)

(b) In an experiment to determine the refractive index of a liquid, the liquid was poured into a measuring cylinder, a pin was placed at the bottom of the cylinder and another pin was used to locate the apparent position of the first pin. The values of real and apparent depth were used to plot a graph in the figure below.



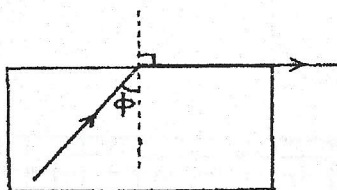
(i) From the graph determine the refractive index of the liquid.

(2 mks)

(ii) Given that velocity of light in vacuum is 3.0×10^8 m/s, what would be the velocity of light in the liquid above? (2mks)

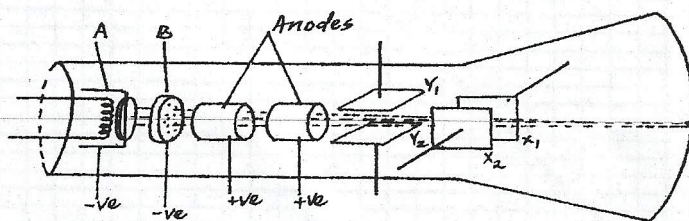
(c) State **two** conditions necessary for total internal reflection to occur. (2mks)

(d) The figure **below** shows a ray of light incident on a glass-air interface.



Given that the refractive index of glass is 1.48, determine the value of ϕ . (3mks)

13. The figure shows the main features of cathode ray oscilloscope (C.R.O).

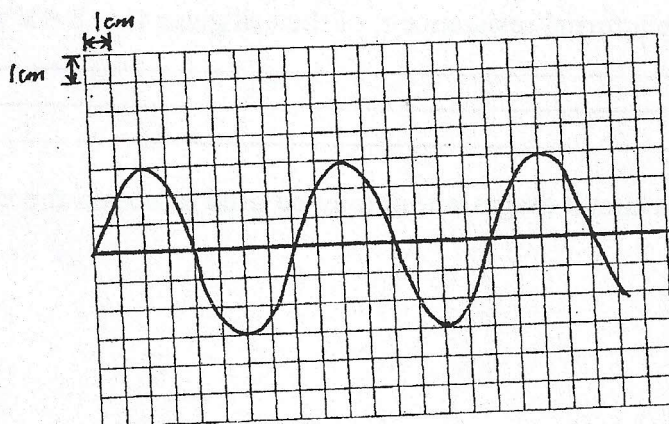


(a) (i) Name the parts labelled **A** and **B**. (2mks)

- (ii) State the function of **B** and briefly outline how it works.
(2mks)

- (iii) State **two** function of the anodes.
(2mks)

The output of an a.c signal was connected across the X- plates of the cathode ray oscilloscope whose time base setting was 5 milliseconds per centimeter and the sensitivity at 10 volts per centimeter, the figure below shows the waveform displayed on the screen of the C.R.O.



Determine

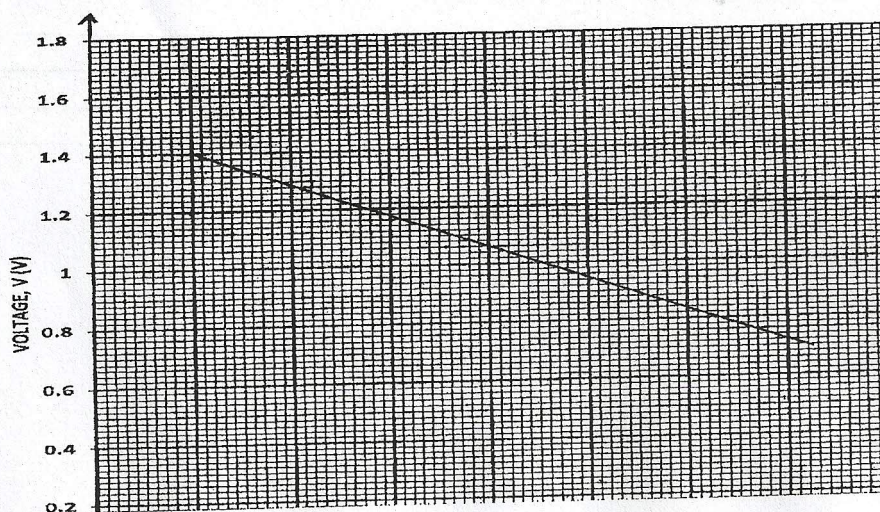
- (i) The peak voltage of the generator.

(2mks)

- (ii) The frequency of the voltage.

(3mks)

14. The graph below shows the variation of p.d (V) across the terminals of a cell and the current drawn from the cell.



(a) Use the graph to determine:

(i) The electromotive force (e.m.f) E of the cell.

(1mk)

(ii) The internal resistance r , of the cell given that $E = V + Ir$.

(3mks)

(b) Draw a circuit diagram that may be used to obtain the values plotted in the graph. (3 mks)

15. (a) state two factors affecting the capacitance of a parallel plate capacitor. (2mks)

(b) A $10\mu\text{F}$ capacitor is charged to a potential difference of 80V and then isolated. It is then connected to an uncharged $20\mu\text{F}$ capacitor. Calculate:

i. The final potential difference between the capacitors. (3 mks)

ii. The final charge on each capacitor. (3 mks)

iii. The final energy stored in the capacitors.

(3 mks)

16. A transformer has 8000 turns in its primary coil and 200 in its secondary coil. The voltage in the primary coil is 240V.

(a) Calculate the voltage in the secondary coil.

(2mks)

(b) If the current in the primary coil is 3A while that in the secondary is 100A, determine the efficiency of the transformer.

(3mks)

(c) State any **two** reasons why the efficiency of the transformer is less than 100%. (2mks)