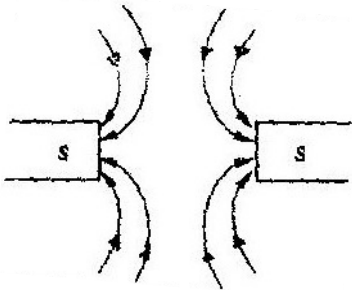


**K.C.S.E 2006: MARKING SCHEME
PHYSICS PAPER 2**

1.



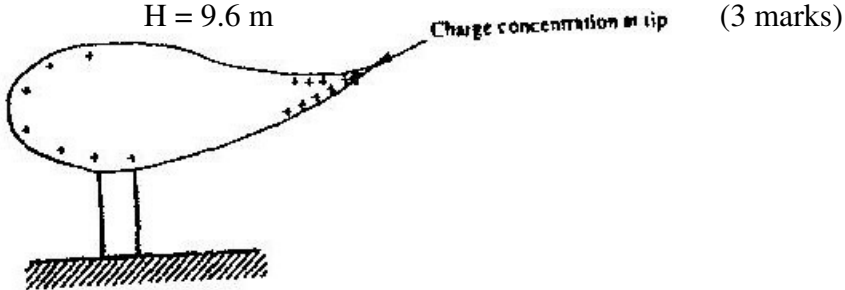
2. Magnification =

$$\frac{\text{Image dist}}{\text{Object dist}} = \frac{\text{ht of image}}{\text{height of object}}$$

$$\frac{10}{600} = \frac{16}{h}$$

$$H = 9.6 \text{ m}$$

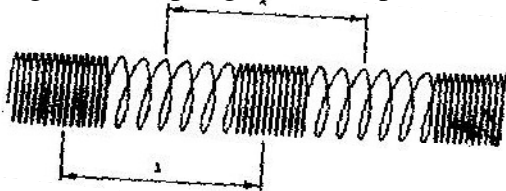
3.



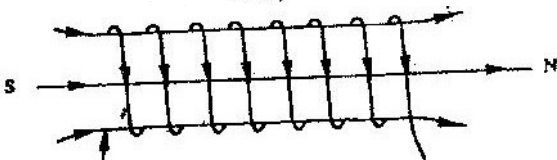
4. To allow escape of gases (H₂ and O₂) from battery

5. (i) Longitudinal wave

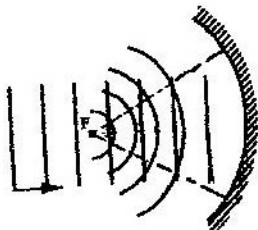
(ii) Length of the spring, from one point to a similar point of vibration



6.



7.



Reflected waves are curved. Either converging circular reflected waves. Converging to F; OR two perpendicular lines from the surface of one of the curves meeting at F. (2 marks)

8. Distance moved by sound waves = 2x;
2x = speed x time

$$X = \frac{330 \times 1.8}{2}$$

$$= 297\text{m}$$

(3 marks)

9.

- Constant temperature
- No mechanical strain

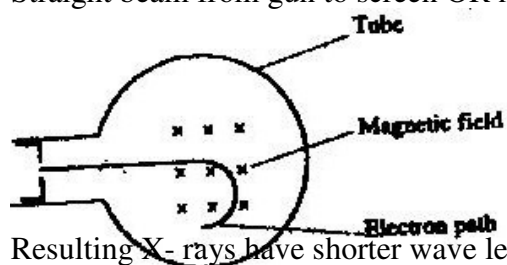
(1 mark)

10. Work function of a metal is the minimum energy required to set free (release) an electron from the surface of the metal (1 mark)

11. Threshold frequency K.E of electron = 0 hence velocity of the electron would be zero; (No motion) thus photo electric effect cannot be observed (2 marks)

12. Straight beam from gun to screen OR no gravitational effect on the beam. (1 mark)

13.



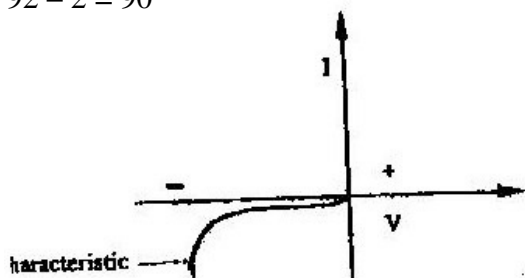
14. Resulting X- rays have shorter wave length/ hard/ high frequency because electrons have higher K.E (2 marks)

15. $a = 234 + 4 = 238$

$b = 92 - 2 = 90$

(2 marks)

16.



17. (a) Charge Q, on C_1 is given by

Charge $Q_1 = C_1 V$;

$= 0.3 \mu F \times 4.5$;

$1.35\mu C$;

(3 marks)

(b) $C_T = C_1 + C_2$;

$= (0.3 + 0.5) \mu F$

$= 0.8 \mu F$

(2 marks)

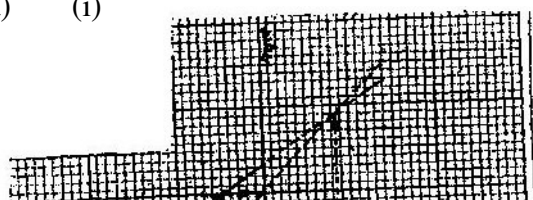
(c) (i) 4.5v

(1 mark)

(ii) Observed on voltmeter p.d drops to less than 4.5 (1 mark)

(iii) The drop of p.d in C (ii) is because the charge on C_1 is distributed to C_2 . Since values of C_1 and C_2 remain constant, when Q on C_1 reduces, then $Q = C_1 V$ implies V must reduce also, hence voltmeter reading reduced.

18. (a) (i)



line.info

(ii) Image at 10cm from mirror (using scale) (2 marks)

(iii) Magnification

$$\frac{\text{Size of image}}{\text{Size of object}} = \frac{4.0 \text{ cm}}{2.0 \text{ cm}} = 2$$

OR

$$\frac{\text{Image distance}}{\text{Object distance}} = \frac{2.0 \text{ cm}}{1.0 \text{ cm}} = 2$$

(b) (i) I Image distance

$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

$$\frac{1}{v} = \frac{1}{5} - \frac{1}{20} = \frac{3}{20}$$

$$v = \frac{20}{3} = 6.67 \text{ cm}$$

II Magnification

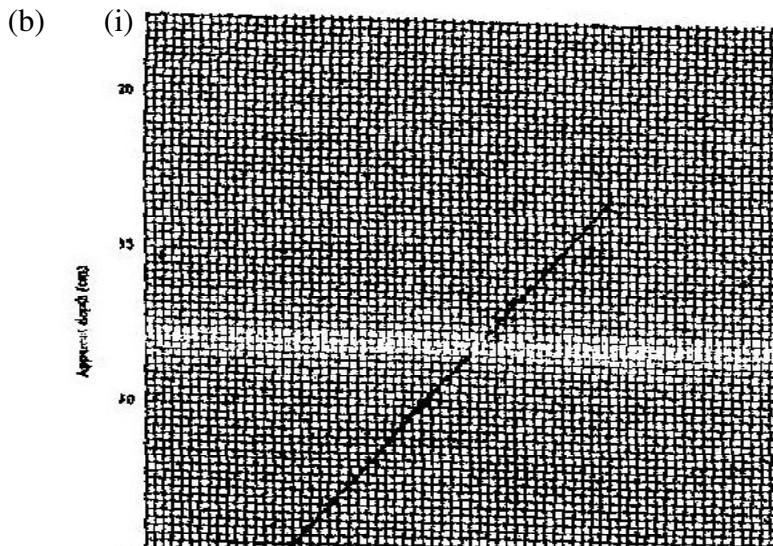
$$= \frac{v}{u} = \frac{6.67}{20} = 0.33; \quad (2 \text{ marks})$$

(ii) Image characteristics: real, inverted, diminished, less bright
(2 marks)

19. (a) Refr. Index $n = \frac{\sin i}{\sin r} = \frac{\text{velocity in air}}{\text{velocity in substance}}$

OR

$$n = \frac{\text{Real depth}}{\text{Apparent depth}} \quad (1 \text{ mark})$$



(ii) Slope of graph = $\frac{16}{24} = \frac{2}{3}$
 Refr. Index $n = \frac{\text{Real}}{\text{Apparent}} = \frac{1}{\text{slope}}$
 $= \frac{3}{2} = 1.5$ (4 marks)

(c) $n = \frac{\sin 90^\circ}{\sin \theta} \Rightarrow \sin \theta = \frac{1}{1.5} \Rightarrow \theta = 38.7^\circ = \text{critical angle}$ (3 marks)

20. (a) (i) P = slip rings
 Q = Brushes (2 marks)

(ii) 0-90 magnetic flux cut changes from high to low. (decreasing);
 90 – 180 magnetic flux change from low to high. (increasing)
 At each peak 0 – 180 magnetic flux change is maximum though in different directions, (position of coil). (3 marks)

(b) (i) $\epsilon_s = N_s \frac{d\phi}{dt} \Rightarrow \epsilon_s = 240 \times \frac{60}{1200} = 12 \text{ volts}$ (2 marks)

(ii) $P_p = P_s$ (power) or $I_s V_s = I_p V_p$

$I_s = I_p \frac{V_p}{V_s} = 0.5 \times \frac{240}{12} = 10 \text{ A};$ (3 marks)

21. (a) (i) P = Ring circuit (1 mark)
 X = Neutral (point or terminal)
 Y = Live (point or terminal) (2 marks)

(ii) I Purpose of R – or fuse; is a safety element in a circuit against excess current
 II R is connected to Y but not X to ensure that when it breaks a circuit any gadget/ appliance connected does not remain live. (1 mark)

(iii) Earthing is necessary in such a circuit to guard against electric shocks.

- (b) Cost of electricity
 $1.5 \text{ kw} \times 30\text{h} \times 8 \text{ Kshs} = \text{Kshs } 360/=$