



Marking Scheme Physics –July2015Grade:-12(2016)

M.C.Q Answers

- 1) 3 2) 1 3) 2 4) 2 5) 4 6) 4 7) 3 8) 1 9) 1 10) 1
 11) 4 12) 2 13) 3 14) 5 15) 3 16) 5 17) 5 18) 2 19) 1 20) 2
 21) 3 22) 2 23) 3 24) 2 25) 3

25 x 2 = 50

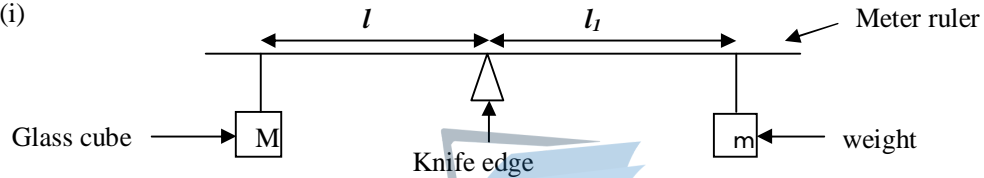
Structured Essay

1 (a) (i) Vernier Calliper (01)

(ii) for meter ruler:- fractional error increase / accuracy decrease in length measurement-----(01)

for micrometer screw gauge: - maximum measuring length is 2.5 cm (01)

(b) (i)



Correct diagram----- (01)

Correct labeling (01)

(ii) Adjust the position of the ruler until it gets balance over the knife edge horizontally. (01)

(iii) To avoid, mass of the meter ruler in the calculation. (01)

(c) (i) Weight:- 50g (01)

Reason:- To decrease the fractional error in length measurement (01)

(d) (i) fully immerse the glass cube in water and rebalance the ruler by adjust weight (m).----- (01)

(ii) distance between knife edge and new position of m. (01)

(e) $m l_2 = \left(M - \frac{dw}{dg} M \right) l$ (02)

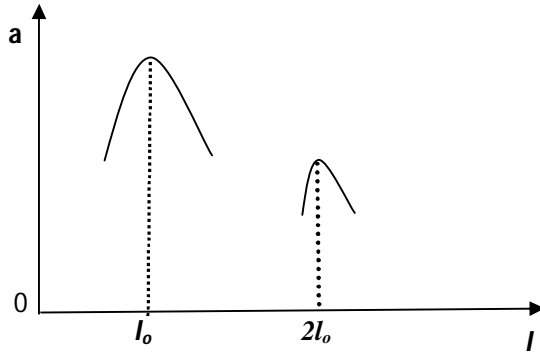
$d_g = \left(\frac{l_1}{l_2 - l_1} \right) d_w$ (01)

(f) $d_g = \left(\frac{35}{49-35} \right) 1000 = 2500 \text{ kgm}^{-3}$ (01)

2. (a) (i) On the sonometer box.----- (01)

(ii) Stationary and transverse waves (both correct) (01)

(iii)



Shape of the curves----- (01)

Denote peak positions ----- (01)

(b) Bring the two pegs closer together, while vibrating tuning fork place on sonometer box ----- (01) + (01)

gradually increase the distance between the pegs until paper rider jumps off,----- (01)

finally measure the distance between the pegs.

(c) $f = \frac{1}{2l_0} \sqrt{\frac{T}{m}}$ ----- (01)

(d) (i) $f = \frac{n_1}{2l_1} \sqrt{\frac{T}{m_1}}$, $f = \frac{n_2}{2l_2} \sqrt{\frac{T}{m_2}}$ ----- (01)

$\frac{m_1}{m_2} = 4$, $\frac{n_1}{n_2} = \frac{l_1}{l_2} \sqrt{\frac{m_1}{m_2}} = \frac{3}{2} \sqrt{4} = 3/1$ ----- (01) + (01)

(ii) AB:- 3 BC:- 1 (both correct) ----- (01)

(iii) $\frac{\lambda_{max}}{2} = 40 \text{ cm}$, $\lambda_{max} = 80 \text{ cm}$ or 0.8 m ----- (01)

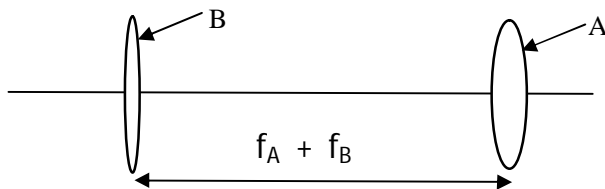
(iv) $V = \sqrt{\frac{40}{1 \times 10^{-3}}} = 200 \text{ ms}^{-1}$ ----- (01)

$f = \frac{V}{\lambda_{max}} = \frac{200}{0.8} = 250 \text{ Hz}$ ----- (01)

3. (a) (i) Objective:- B
Eye piece:- A (both correct) ----- (01)

(ii) focal length of B is grater than focal length of A. ----- (01)

(b) (i)



Correct position and labelling the lenses-- (01)

Denote correct distance between the
Lenses ----- (01)

(ii) infinity (01)

(iii) $M = f_B / f_A$ (01)

(c) (i) $M = D/d$ (01)

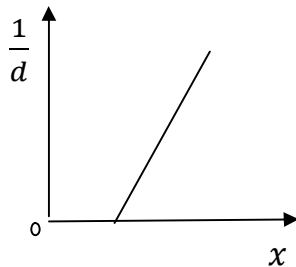
(ii) All of the rays come through objective , pass through the image of objective so that the position of image is best position for placing eyes to observe the image. (02)

(d) $\frac{1}{V} - \frac{1}{U} = \frac{1}{f}$, $f_A = f$ say. $\frac{1}{V} + \frac{1}{x} = \frac{1}{f}$ (01)

$$\frac{x}{V} + 1 = \frac{x}{f} \text{ (01)}$$

$$\frac{1}{d} = \frac{1}{Df} x - \frac{1}{D} \text{ (01)}$$

(e) (i)



Correct graph (01)

Labeling the axes (01)

(ii) focal length of A. or f_A (01)

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4. (a) Heat the tube , immerse open end of the tube into the mercury and cool it (01)

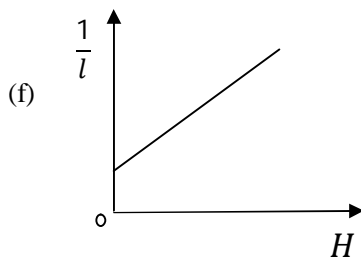
(b) $V = la$ (01) $P = \left(\pi + \frac{hH}{L} \right) \text{ cmHg}$ (01)

(c) change the inclined position of the tube and obtain the corresponding measurements of H and l (01)

(d) $PV = k$ k —constant (01)

$$\left(\pi + \frac{hH}{L} \right) la = k \text{ (01)}$$

(e) $\frac{1}{l} = \frac{ah}{kL} H + \frac{\pi a}{k}$ (01)



Correct graph (01)

Labeling the axes (01)

(g) (i) $\frac{c}{m} = \frac{\pi}{h} L$ -----(01)

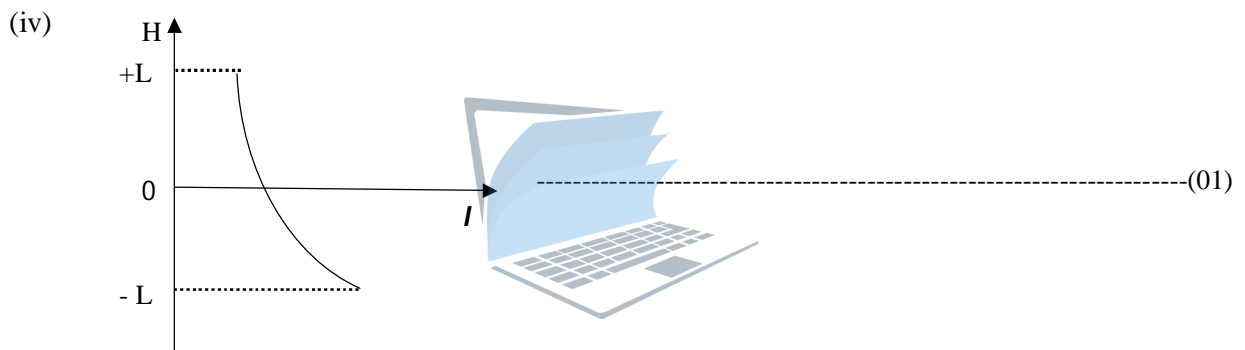
$\pi = \frac{c}{m} \times \frac{h}{L} = \frac{0.05}{1.64 \times 10^{-4}} \times \frac{10}{40}$ (correct substitution) -----(01)

$\pi = 76.25 \text{ cmHg}$ -----(01)

(ii) $H = 0$, $\frac{1}{l} = \frac{\pi a}{k}$ -----(01)

$\frac{1}{l} = 0.05$, $l = 20 \text{ cm}$ -----(01)

(iii) No , When h is small as the pressure exerted on the air column is small so that length of air column will not change some extent. -----(01)



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