

S.Chand Pg-228

12. a) ~~speed~~ Velocity of light in air =  $3 \times 10^8$  m/s = c

Velocity of light in flint glass =  $1.86 \times 10^8$  m/s =  $v_1$

Absolute refractive index of flint glass =  $\frac{c}{v_1}$

$$n = \frac{3 \times 10^8}{1.86 \times 10^8} = \frac{300}{186}$$

$$= \frac{50}{31} = 1.61$$

$$\begin{array}{r} 186 \overline{) 300} \quad | \quad 1.5 \\ \underline{186} \phantom{0} \\ 1140 \\ \underline{930} \\ 210 \end{array}$$

Absolute refractive index of crown glass =  $\frac{c}{v_2}$

$$= \frac{3 \times 10^8}{1.97 \times 10^8} = 1.5$$

$$\begin{array}{r} 31 \overline{) 50} \quad | \quad 1.61 \times \frac{5}{4} \\ \underline{31} \phantom{0} \\ 190 \\ \underline{186} \\ 40 \\ \underline{31} \\ 9 \end{array}$$

b. Relative refractive index =  $\frac{v_2}{v_1}$

$$= \frac{1.86}{1.97} = \frac{1.86 \times 10^8}{1.97 \times 10^8} = 0.944$$

13. a)  $\frac{\text{Velocity of light in air}}{\text{Velocity of light in 'X'}} = \frac{3 \times 10^8 \text{ m/s}}{2 \times 10^8 \text{ m/s}}$

$$= 1.5$$

b)  $\frac{\text{Velocity of light in air}}{\text{Velocity of light in 'Y'}} = \frac{3 \times 10^8 \text{ m/s}}{2.5 \times 10^8 \text{ m/s}}$

$$= 1.2$$

c)  $\frac{\text{Velocity of light in 'X'}}{\text{Velocity of light in 'Y'}} = \frac{2 \times 10^8 \text{ m/s}}{2.5 \times 10^8 \text{ m/s}}$

$$= \frac{4}{5} = 0.8$$

$$\begin{array}{r} 5 \overline{) 6} \quad | \quad 1.2 \\ \underline{5} \phantom{0} \\ 10 \\ \underline{10} \\ 0 \end{array}$$

$$\begin{array}{r} 5 \overline{) 4} \quad | \quad 0.8 \\ \underline{0} \\ 40 \\ \underline{40} \\ 0 \end{array}$$

14.  $\frac{6}{5} = \frac{3 \times 10^8 \text{ m/s}}{x}$

$\Rightarrow 6x = 3 \times 5 \times 10 \times 10^7$

$\Rightarrow x = \frac{3 \times 5 \times 10^5}{2} \times 10^7$

$\Rightarrow x = 2.5 \times 10^8 \text{ m/s}$

15.  $\frac{3}{2} = \frac{3 \times 10^8}{x}$

$\Rightarrow 3x = 6 \times 10^8$

$\Rightarrow x = 2 \times 10^8 \text{ m/s}$

speed of light in glass is  $2 \times 10^8 \text{ m/s}$

16. Refractive index of water =

$\frac{3 \times 10^8}{225 \times 10^8} = \frac{300}{225}$

$\frac{4}{3}$

= 1.333

$\frac{3}{3} \mid \frac{4}{1} \mid 1.3$   
 $\frac{10}{10}$

17.  $\frac{242}{100} = \frac{3 \times 10^8}{x}$

$\Rightarrow 121x = 3 \times 5 \times 10^9$

$\Rightarrow x = 1.24 \times 10^8 \text{ m/s}$

M.C.Q.

19.  $\frac{K \cdot v}{v}$

So medium having least refractive index will have maximum speed

d.c.s

20. of material c

21.  $M_{21} = \frac{1}{M_{12}} \Rightarrow M_{12} = \frac{1}{M_{21}}$

$$M_{12} = \frac{1}{\frac{3}{2}} = \frac{2 \times 2}{3 \times 2} = \frac{4}{6}$$

c)  $\frac{4}{6}$

22.  $M_d \frac{1}{\pi}$

c) in medium C

23.  $\frac{3 \times 10^8}{1.25 \times 10^8} = 2.4$

a) 2.4

24. d) Substance P

25. a) 1.33

26. c) 0.75

27. d) Carbon disulphide

28.  $\frac{3}{2} \times \frac{3}{4} = \frac{9}{8} = 1.125$  d)

$$\begin{array}{r} 8 \overline{) 91.25} \\ \underline{8} \phantom{0} \\ 10 \\ \underline{8} \\ 20 \\ \underline{16} \\ 40 \end{array}$$