Pg - 228 Schaud

Q12) a) Refractive index (flint glass) = $\frac{\text{speed of light in vacuum}}{\text{speed of light in flint glass}} = \frac{3 \times 10^8}{1.86 \times 10^8} = 1.61$

$n_{crown} = \frac{\text{speed of light in vacuum}}{\text{speed of light in crown glass}}$

$= \frac{3 \times 10^8}{1.97 \times 10^8} = 1.52$

b) $n_{flint}^{crown} = \frac{\text{speed of light in crown glass}}{\text{speed of light in flint glass}}$

$= \frac{1.97 \times 10^8}{1.86 \times 10^8} = 1.059$

18) Speed of light in air = 3×10^8 m/s

" " " in medium X = 2×10^8 m/s

" " " in medium Y = 2.3×10^8 m/s

a) $\text{air } n_x = \frac{3 \times 10^8}{2 \times 10^8} = 1.5$

b) $\mu_{air} = \frac{3\times10^8 m/s}{2.5\times10^8 m/s} = 1.2$

c) $\mu_y = \frac{2\times10^8 m/s}{2.5\times10^8 m/s} = 0.8$

(4) Refractive Index = 1.4
Speed of light in air = 3×10^5 km/s

⇒ Refractive index = $\frac{\text{Sp. of light in air}}{\text{Sp of light in medium}}$

⇒ $1.4 = \frac{3\times10^5}{\text{Sp. in medium}}$

⇒ Sp. of light in medium = 2500000 km/s

(5) $\mu = 1.7$
Sp. of light in air = 3×10^8 m/s

$1.7 = \frac{3\times10^8}{\text{sp. of light in glass}}$

⇒ Sp. of light in glass = 1.76×10^8 m/s

16) sp. of light in water = 2.25×10^8 m/s
sp. of light in vacuum = 3×10^8 m/s

$$n = \frac{3 \times 10^8}{2.25 \times 10^8} = 1.33$$

17) $n = 2.42$
sp. of light in air = 3×10^8 m/s

$$2.42 = \frac{3 \times 10^8}{\text{speed of light in diamond}}$$

$$= 1.239 \times 10^8 \text{ m/s}$$

MCQs

19) d) 1.31

20) c) material C - 1.77
It has maximum R.I

21) $\frac{1}{2} = \frac{2}{3}$ c) $\frac{4}{6}$

22) the angle of reflection is minimum in the medium with more refractive index.
c) in medium C.

23) $\frac{1.25 \times 10^8 \text{ m/s}}{3 \times 10^8 \text{ m/s}} \approx 2.4$ (a)

24) The angle of refraction will be max. in sub. with min. RI.
d) substance R - 2.42.

25) at 1.33 = RI of water.

26) $\frac{1}{\frac{4}{3}} = \frac{3}{4} = 0.75$ (c)

27) The light travels the slowest in material with max. RI.
d) carbon disulphide = 1.63

28) $\frac{B}{u} \times \frac{3}{2} = \frac{9}{8} = 1.125$ (d)