Schaud (pg 228)

12 Ans

(a) Refractive index $= \frac{\sin i}{\sin r}$

(a) $n_{flint} = \frac{\text{speed of light in vacuum}}{\text{speed of light in flint glass}} = \frac{3 \times 10^8}{1.86 \times 1}$

$n_{flint} = 1.61$

(b) $n_{crown} = \frac{\text{speed of light in vacuum}}{\text{speed of light in crown}} = \frac{3 \times 10^8}{1.97 \times 10^8}$

$n_{crown} = 1.52$

(b) $_{crown}n_{flint} = \frac{1.97 \times 10^8}{1.86 \times 10^8} = 1.059$

13 Ans (a) $_{air}n_x = \frac{\text{speed of light in air}}{\text{speed of light in medium } x} = \frac{3 \times 10^8}{2 \times 10^8}$

$_{air}n_x = 1.5$

(b) $_{air}n_y = \frac{\text{speed of light in air}}{\text{speed of light in medium } y} = \frac{3 \times 10^8}{2.50 \times 10^8}$

$_{air}n_y = 1.2$

(c) $_x n_y = \frac{\text{speed of light in medium } x}{\text{speed of light in medium } y} = \frac{2 \times 10^8}{2.50 \times 10^8}$

$_x n_y = 0.8$

14 AM Refractive index of medium = 6/5

speed of light in air = 3,00,000km/s

μ = $\frac{\text{speed of light in air}}{\text{speed of light in medium}}$ = $\frac{6}{5}$ = $\frac{300000}{\text{speed in medium}}$

$\Rightarrow 1.2 = \frac{300000}{\text{speed of light in medium}}$ = 250000km/h

0% speed of light in Medium is 250000km/s

15 AM μ of glass slab = 1.5

(c) = 3×10^8 m/s

$\mu = \frac{c}{v} \Rightarrow 1.5 = \frac{3 \times 10^8}{v \text{ in medium}}$ = 2×10^8 m/s

16 AM

speed of light in vacuum = 3×10^8 m/s

" " in water = 2.25×10^8

μ_{water}

Refractive index of water = $\frac{3 \times 10^8}{2.25 \times 10^8}$ = 1.33

17 AM $\mu_{diamond}$ = 2.42

speed of light = 3×10^8 m/s

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

20 Ans = $\frac{3\times10^8}{\text{speed in medium}}$ = 1.339×10^8 m/s

MCQ's

19 Ans	S (a)	25 Ans	1.33 (a)
20 Ans	Material (C) → (c)	26 Ans	0.75 (c)
21 Ans	4/6 (c)	27 Ans	Carbon Dioxide
22 Ans	in medium C (a)	28 Ans	1.125 (a)
24 Ans	Substance @ S (a)		

Uploading it again as it has no explanation

19 Ans Option (d) Substance S

The refractive index is verselly proportional to speed of light in substance so speed in (S) is maximum as it has least refractive index

20 Ans Option (c) Material c

The more the refractive index more it will change the direction of beam of light passing so as material 'c' has most (4) it is refract

21 Ans $\mu_g^a = 3/2$ $\mu_a^g = 1/\mu_g^a = 1/3/2 = \frac{2}{3}$

Option (c) 2 4/6 = $\frac{2}{3}$

22 Ans In medium (c)
The more the refractive index the lesser is Lofrya

23 Ans 2.4 (option A)

$$\mu = \frac{\text{speed of light in air}}{\text{speed of light in substance}} = \frac{3\times10^8}{1.25\times10^8} = 2.4$$

24 Ans Substance S (d)

26 Ans 1.33 (a)

27 Ans $\mu = \frac{1}{\mu \text{ of water wrt air}} = \frac{1}{3/4} = 0.75$

0.75 (option c)

28 Ans option (a)

As μ is the ratio of

μ water wrt air = 4/3

μ glass wrt air = 3/2

μ of water wrt glass = $\frac{\mu \text{ (water)}}{\mu \text{ (glass)}} = \frac{4/3}{2/3}$

= 8/9

μ glass wrt water = $\frac{\mu_{glass}}{\mu_{water}} = 3/2 / 4/3$

= 9/8 = 1.125