Pg 228

(12) a) Refractive index, $= \frac{\text{Speed in Vacuum}}{\text{Speed in glass}}$

$\Rightarrow \frac{3 \times 10^8}{1.86 \times 10^8} = 1.61.$

$n_{crown} = \frac{\text{Speed in light in Vacuum}}{\text{Speed in glass}}$

$= \frac{1.97 \times 10^8}{1.8}$ $\quad \frac{3 \times 10^8}{1.97 \times 10^8}$

$= 1.52.$

$n_{flint} = \frac{v \text{ light in glass}}{v \text{ light in flint}}$

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

13) Speed of light in air $\Rightarrow 3 \times 10^8$ m/s

" " " " medium x $\Rightarrow 2 \times 10^8$ m/s

" " " " Y $\Rightarrow 2.5 \times 10^8$ m/s

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

b) air $^n y = \frac{3 \times 10^8}{25 \times 10^8} = 1.2$

c) $x^n y = \frac{2 \times 10^8}{2.5 \times 10^8} = 0.8$

14) Retractive index = 1.4
speed of light in air = 3×10^3 km/s

$\Rightarrow n = \frac{\text{Sp of light in air}}{\text{" light in medium}}$

$1.4 = \frac{3 \times 10^3}{n}$

$n = \frac{3 \times 10^3}{1.4} = 250000$ km/s

15) $n = 1.7$.
Sp of light in air = 3×10^8 m/s

$1.7 = \frac{3 \times 10^8}{n}$

$\Rightarrow n = 1.76 \times 10^8$ m/s

16) Sp of light in water = 2.25×10^8 m/s
" " " " Vacuum = 3×10^8 m/s

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

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

$2.42 = \frac{3 \times 10^8}{n}$ $\Rightarrow n = 1.24 \times 10^8$ m/s

18) MCQs

19) d) 1.31

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

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

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

23) $\frac{1.25 \times 10^8 m/s}{3 \times 10^8 m/s} = 2.4.$

24) The angle of refraction will
be 0 man in Sub with min R.I
d) Substance R → 2.42

25) a) 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) - 1.63

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