

$$12) \text{ Refractive index} = \frac{\text{Sine of the angle of incidence}}{\text{Sine of the angle of refraction}}$$

$$a) n_{\text{flint}} = \frac{\text{Speed of light in vacuum}}{\text{Speed of light in flint glass}}$$

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

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

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

13) Given,

$$\text{Speed of light in air} = 3 \times 10^8 \text{ m/s}$$

$$\text{Speed of light in medium X} = 2 \times 10^8 \text{ m/s}$$

$$\text{Speed of light in medium Y} = 2.5 \times 10^8 \text{ m/s}$$

$$\text{a) } n_{\text{air} \rightarrow \text{X}} = \frac{\text{Speed of light in air}}{\text{Speed of light in medium X}}$$

$$= \frac{3 \times 10^8 \text{ m/s}}{2 \times 10^8 \text{ m/s}} = 1.5$$

$$\text{b) } n_{\text{air} \rightarrow \text{Y}} = \frac{\text{Speed of light in air}}{\text{Speed of light in medium Y}}$$

$$\frac{3 \times 10^8 \text{ m/s}}{2.5 \times 10^8 \text{ m/s}} = 1.2$$

$$\text{c) } n_{\text{X} \rightarrow \text{Y}} = \frac{\text{Speed of light in medium X}}{\text{Speed of light in medium Y}}$$

$$\frac{2 \times 10^8 \text{ m/s}}{2.5 \times 10^8 \text{ m/s}} = 0.8$$



- 14) Refractive index of medium = 1.4  
Speed of light in air = 3,00,000 km/s

Refractive index of medium

$$= \frac{\text{Speed of light in air}}{\text{Speed of light in medium}}$$

$$1.4 = \frac{300000}{\text{Speed of light in medium}}$$

$$\text{Speed of light in medium} = 214.28571428571$$

- 15) Refractive index of glass = 1.7  
Speed of light in air =  $3 \times 10^8$  m/s

$$\text{Speed of light in glass} = \frac{\text{Speed of light in air}}{\text{Refractive index of glass}}$$

$$= \frac{3 \times 10^8}{1.7} = 1.76 \times 10^8 \text{ m/s}$$

16) Speed of light in vacuum =  $3 \times 10^8$  m/s  
Speed of light in water =  $2.25 \times 10^8$  m/s

Refractive index of water =  $\frac{\text{speed of light in vacuum}}{\text{speed of light in water}}$

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

17) Refractive index of diamond = 2.42  
Speed of light in air =  $3 \times 10^8$  m/s

Refractive index of diamond =  $\frac{\text{speed of light in air}}{\text{speed of light in diamond}}$

$$\text{Speed of light in diamond} = \frac{3 \times 10^8}{2.42} = 1.239 \times 10^8 \text{ m/s}$$

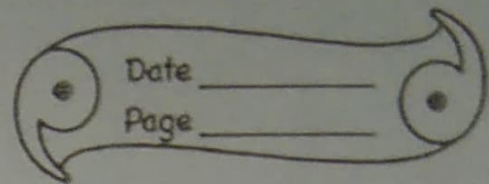
19) d) S

21) c)  $\frac{y}{c}$

20) c)  $\frac{y}{c}$  material C

22) c) in medium C





23) a) 2.4

24) d) substances

25) a) 1.33

26) c) 0.75

27) d) carbon disulphide

28) d) 1.125