Home Assignment

1) figure shows array of light as it travel from medium A to medium B. Refractive index of the medium B relative to medium A is.

a) 3/2
b) 2/3
c) 1/2
d) 2

2) The path of a ray of light coming from air passing through a rectangular glass slab traced by four students are shown as A, B, C and D in figure. which one of them is correct.

a) A
b) B
c) C
d) D

3) You are given water, mustard oil, glycerine, and kerosene. in which of these media a ray of light incident obliquely at same angle would bend the most ?

(a) kerosene
(b) water
(c) mustared oil
(d) Glycerine.

4) A pencil when dipped in water in a glass tumbler appears to be bent at the interface of air and water. Will the pencil appear to be bent to the same extent, if instead of water we use liquids like, kerosene or turpentine. Support your answer with reason.

5) How is the refractive index of a medium related to the speed of light? Obtain an expression for refractive index of a medium with respect to another in terms of speed of light in these two media?

Answer

Refractive index of B w.r.t A

$$\frac{\sin i}{\sin r}$$

$$\frac{\sin 60^\circ}{\sin 45^\circ}$$

$$\frac{(\sqrt{3}/2)}{(1/\sqrt{2})}$$

$$\frac{\sqrt{3} \times \sqrt{2}}{2 \times 1} = \frac{\sqrt{3}}{\sqrt{2}}$$

2→ B

3→ Glycerin which ~~refractive~~ refract, ne index is - highest ray leends towards most.

4→ No, the pencil will not appear to be bent to the same extent. Different materials have different refractive index. So the amount of refraction will be different. Refractive Index of kerosene or turpentine is greater than water.

5→ ~~Refractive index = Speed of light in water / Speed of light in air~~

5→ Refractive index = Speed of light in air / Speed of light in medium

Refractive index of one medium in relation to a second medium is given by ratio of ratio of speed of light in second medium to speed of light

in first medium.