- Q.1 The critical angle for light going from medium x into medium y is θ . The speed of light in medium x is v. The speed of light in medium y is (A)v(1 - cos θ) (B)v/sin θ (C)v/cos θ (D)vcos θ
- **Q.2** Light takes time t_1 to travel a distance x_1 in rarer medium(M_1) and the same light takes time t_2 to travel a distance x_2 in a relatively denser medium(M_2). The critical angle for the medium M_2 will be **(A)** $\sin^{-1}\mathbb{C}_{x_1t_1}^{x_2t_2}$ **(B)** $\sin^{-1}\mathbb{C}_{x_2t_1}^{x_1t_2}$ **(C)** $\sin^{-1}\mathbb{C}_{x_2t_2}^{x_1t_1}$ **(D)** $\sin^{-1}\mathbb{C}_{x_1t_2}^{x_2t_1}$

Q.3 A ray is incident from glass on the boundary separating glass and water. Refractive index for glass is $\frac{3}{2}$ and refractive index for water is $\frac{4}{3}$. The critical angle for the glass-water boundary is

(A)
$$\sin^{-1}\mathbb{Z}_{4}^{\frac{3}{2}}$$
 (B) $\sin^{-1}\mathbb{Z}_{3}^{\frac{1}{2}}$ (C) $\sin^{-1}\mathbb{Z}_{9}^{\frac{3}{2}}$ (D) $\sin^{-1}\mathbb{Z}_{9}^{\frac{1}{2}}$

Q.4 Two transparent media A and B are separated by a plane boundary. The speed of light in medium A is $2.0 \times 10^8 \text{ ms}^{-1}$ and in medium B is $2.5 \times 10^8 \text{ ms}^{-1}$. The critical angle for a ray of light going from medium A to B



- Q.5For which of the given colors, Critical angle of light passing from glass to air is minimum. [Assume, reflection at interface is negligible]
(A)Red(C)Yellow(D)Violet
- Q.6The maximum angle of refraction when a light ray is refracted from glass ($\mu = 1.5$) to air is
(A)45°(B)30°(C)60°(D)90°
- **Q.7** In the figure shown below, find the minimum value of i for which total internal reflection never takes place at P. [Medium surrounding the slab has refractive index μ_2]



Q.8 A light ray is incident on an inclined glass-air interface as shown. The largest angle φ for which the light ray is totally reflected at the surface AC is -



Q.9 A ray of light from a denser medium strikes at the interface of a rarer medium at an angle of incidence i. If the reflected and refracted rays are mutually perpendicular to each other, then the critical angle is

(A)sin⁻¹ (tan/i)

(A)√2

(B)cos⁻¹(tan)

(B)√3

(**C)**tan⁻¹ (cos i)

(D) \tan^{-1} (sin (1))

Q.10 A right-angled prism is to be made by selecting a proper material and the angles A and B ($B \le A$), as shown in the figure. It is desired that a ray of light incident on the face *AB* emerges parallel to the incident direction after two internal reflections. What should be the minimum refractive index above which the internal reflections happens?



(D)√6

ANSWER KEY

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(B)	(D)	(C)	(C)	(D)	(D)	(D)	(A)	(A)	(A)