Q2. The refractive index of core and cladding of a SI fiber are 1.52 and 1.41 respectively. Calculate (i) critical angle (ii) NA and (iii) maximum incidence angle.

Given:- $\mu_1 = 1.52; \quad \mu_2 = 1.41$

Formula:- $\varphi_c = \sin^{-1}\frac{\mu_2}{\mu_1}$; $N.A. = \sin\theta_0 = \sqrt{\mu_1^2 - \mu_2^2}$

Solution:- $\varphi_c = \sin^{-1}(\frac{1.41}{1.52}) = 68.06^\circ$

N.A.= $\sqrt{1.52^2 - 1.41^2}$ = 0.5677

$\theta_0 = \sin^{-1}(0.5677)$

= 34.59˚

Ans:- The critical angle is 68.06˚ and N.A. is 0.5677 and θ_0 is 34.59˚