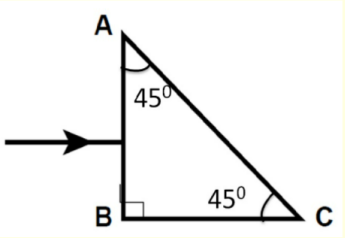
Ques1.

Consider the prism as shown in the figure. $\angle ABC = 90°$; the other two angles are both $45°$. A linearly polarized light with intensity I_0 is incident normally (at right angle) on the surface AB of the prism as shown in the figure. The intensity of light as it finally emerges into the air from the prism through the same surface AB as a fraction of incident light intensity I_0 is 0.79 Expected Solutions: 0.09 . The refractive index of the prism is 2. Round off the answer to two decimal places.



Ques2.

Consider a circularly polarized electromagnetic plane wave traveling along the z-direction in free space which is described by the $\vec{E}$ field (in SI units) as $\vec{E}(\vec{r},t) = 10^4[\sin(\omega t - 2\pi \times 10^4 z)\hat{x} - \cos(\omega t - 2\pi \times 10^4 z)\hat{y}]$. Now we place a perfectly conducting plate at $z = 0$. The radiation pressure acting on the plate is $m \times 10^n$ Nm^{-2}, where m and n are single digit integers. The values of m and n are 9 Expected Solutions: 2 and -4 Expected Solutions: -3 , respectively.

Ques3.

Suppose a conducting material is subjected to a microwave radiation of 2.5 GHz. The value of relative permittivity for the material is 50 and conductivity is 2 $(\Omega m)^{-1}$. The penetration depth is 0.06 Expected Solutions: 0.02 m. Round off the answer up to two decimal places. [Given: $\tilde{k} = \mu\epsilon\omega^2 + i\mu\sigma\omega$]

Ques4.

Consider a linearly polarized electromagnetic wave of frequency 10 GHz incident normally on an interface of air and a metal. The conductivity of the metal is 5.6×10^7 $(\Omega m)^{-1}$. The distance from the interface inside the metal within which the intensity of the wave becomes 1% of the original intensity is 0.1 Expected Solutions: 1.5 1.6 μm. Round off the answer up to first decimal place.