UNIT V ELECTROMAGNETIC WAVES

Frequency of wave and Conductivity of a medium

1. A uniform plane wave is traveling at a velocity of $2.5\text{x } 10^5$ m/s having wavelength $\lambda = 0.25$ mm in a good conductor. Calculate the frequency of wave and the conductivity of a medium.

Attenuation Constant and Phase Constant

2. Calculate the attenuation constant and phase constant for a uniform plane wave with frequency of 10GHz in a medium for which $\mu = \mu_{0,} \varepsilon_r = 2.3$ and $\sigma = 2.56\text{X}10^{-4}$ mho/m.

Incident, Reflection and Transmitted Coefficients

3. Assume that, $\overline{E}$ and $\overline{H}$ waves, traveling in free space, are normally incident on the interface with a perfect dielectric with $\varepsilon_r = 3.$ Calculate the magnitude of incident, reflected and transmitted $\overline{E}$ and $\overline{H}$ waves at the interface.

4. A uniform plane wave of 200 MHz, traveling in a free space impinges normally on a large block of material having $\varepsilon_r = 4, \mu_r = 9, \sigma = 0.$ Calculate transmission and reflection coefficients at the interface.