

6. a) Write short note on: 8
 i) Faraday law
 ii) Amperes circuit law
- b) Derive the expression for transformer emf. 8
7. a) Write short note on: 8
 i) Circular polarization
 ii) Linear polarization.
- b) Derive wave equation for E & H in free space. 8

OR

8. a) Derive the expression for the attenuation constant, phase constant and intrinsic impedance for a uniform plane wave in a good conductor 8
- b) The magnetic field at the surface of a good conductor is 2A/m. the frequency of the field is 600MHz. If the conductivity of the conductor is $10^7 \text{ } \Omega / \text{m}$. Find the skin depth, surface impedance and the power loss per unit area of the conductor. 8
9. a) Compare Transmission line and wave guide. 6
- b) Calculate the cut-off wavelength of a rectangular wave guide whose inner dimension are $a = 2.3\text{cm}$, and $b = 1.03\text{cm}$ operating in TE_{10} mode. 4
- c) Write short note on guided wave between parallel plane. 6

OR

- 10 a) A parallel plane wave guide has 0.05m height and is filled with material having relative permittivity 2.4. What is the frequency ranges over which there is single mode propagation? If the magnetic field for the mode is 0.1A/m. Find the electric field inside the waveguide. 8
- b) Consider the TE_{10} mode wave operating at 10 GHz frequency and propagating in between the parallel plates separated by a distance of 3cm in air. Find guide wavelength, group velocity, phase velocity & wave impedance. 8
