

[Time: 3 Hours]

[Marks: 80]

N.B: Q.1 is compulsory.
Attempt any Three out of remaining questions.
Assume suitable data.

- Q.1 a) Derive the integral form of continuity equation. 5
b) Explain concept of current density. How is magnetic field evaluated using current sheet. 5
c) Describe Maxwell's equation for time varying fields. 5
d) Prove that $\vec{E} = -\nabla v$. where Symbols have usual meanings. 5
- Q.2 a) Derive an expression for away of two isotropic sources with same amplitude and in phase currents. 10
b) Explain different methods of feeding of parabolic antenna. 10
- Q.3 a) Derive radiation resistance of infinitesimal dipole. 10
b) Explain boundary conditions for electrostatic fields between two dielectric media. 10
- Q.4 a) State and explain principle of pattern multiplication. Explain concept of array factor. 10
b) Explain following concept of antennas with mathematical expressions. 10
i) Radiation pattern ii) Directivity
- Q.5 a) Describe various configurations of horn antenna and explain H plane sectoral horn antenna. 10
b) What is reactive near field. Discuss its importance in communication field and its applications. 10
- Q.6 a) Explain sky wave propagation with reference to D,E and F regions and multiple reflections. 10
b) Design a rectangular microstrip patch with dimension W and L ,over single substrate FR4 whose center frequency is 2.45 GHZ. The height of substrate is 1.6 mm. Find the dimensions W and L taking into account the fringing field. 10