

TIME: 3 HRS

MARKS: 80

- N.B: 1) Question no. 1 is compulsory.**
2) Attempt any three out of the remaining five questions
3) Use suitable data, wherever necessary

Q 1: Attempt any four questions from the following: 20

- a) Derive Poisson's and Laplace's equation.
- b) Explain boundary conditions of **E** and **H** fields for two media.
- c) Explain the radiation resistance, directivity, Beam-width and directive gain of the antenna.
- d) Explain Biot-Savart's law and Ampere's law.
- e) Explain Beam Width of an antenna.

Q.2 (a) Derive Maxwell's equations in integral and point form for static field. 10

Q2 (b) State and Explain Poynting vector using modified Ampere's law, derive the pointing theorem and describe the significance of each of its terms. 10

Q3 (a) Derive an expression for reflection and transmission coefficient for normal incidence in case of reflection from perfect dielectric. 10

Q3 (b) Write Short note on Micro strip antenna and Horn antenna. 10

Q4 (a) Drive the expression for radiation resistance in far field region of an Infinitesimal dipole antenna. 10

Q4 (b) Derive an expression of transmission line equation. 10

Q5 (a) Classify and Explain different types of wave Propagation and define the terms Critical frequency, Virtual height, Maximum unstable frequency and Skip distance. 10

Q5 (b) Define polarization of a wave. Explain the types of polarization. 10

Q6 a) Explain in detail the sources and characteristics of EMI, and EMI control techniques. 10

Q6 b) Explain principle of pattern multiplication. 10
