

Time: 3 Hours

Max. Marks: 80

- Note: (1) Question number 1 is compulsory.
 (2) Solve any THREE out of remaining.
 (3) Assume suitable data if necessary.
 (4) Figures to the right indicate full marks.

Q.1 Attempt any FOUR

- (A) State and explain Gauss's Law. (5)
 (B) Explain ground wave propagation. Which type of polarization is used for ground wave? (5)
 (C) Explain FDM importance and advantages (5)
 (D) Explain isotropic, omnidirectional and directional antenna with suitable examples. (5)
 (E) In free space, $E = e^{j(\omega t - 4x)} \hat{a}_z$ V/m. Find H (5)

Q.2 (A) Derive Maxwell's equation in integral & Point form for time varying field. (10)

- (B) An electric field in a medium which is source free given by $E = 1.5 \cos(10^8 t - \beta z) \hat{a}_x$ V/m where E_m is given amplitude of E, ω is angular frequency & β is phase constant. Obtain D, B, H. Assume $\epsilon_r = 1$, $\mu_r = 1$. (10)

Q.3 (A) Explain Poynting vector. Derive Poynting theorem and describe significance of each term. (10)

- (B) Explain MOM method in detail. State its advantages and drawbacks in detail. (10)

Q.4 (A) Derive the expression for radiation resistance in far field region of an infinitesimal dipole (10)

- (B) Explain ionospheric propagation. A high frequency radio link has to be established between two points at a distance of 2000 km. on the earth's surface. Considering the height of 200 km and critical frequency of 5 MHz. Calculate MUF for given path. (10)

Q.5 (A) Classify and Explain different types of wave propagation. (10)

- (B) What is line of sight propagation? Obtain expression for range of line of sight for space wave propagation in terms of antenna's transmitting and receiving heights. (10)

Q.6 Attempt any TWO

- (A) Explain folded dipole antenna and its applications. (10)
 (B) Boundary conditions for static E and M fields. (10)
 (C) Give the comparison of FDM, FEM and MOM. (10)
