

TE Sem-VI · Sem C-scheme May 2026
EXTC 11/05/2026

Time: 3 Hours

Max. Marks :80

- N.B:**
1. Each question carries 20 marks
 - 2: Question no 1 is compulsory
 - 3: Attempt any three out of remaining
 - 4: Assume suitable data wherever required

Q.1 Answer any four

20 Marks

- (i) Enlist Maxwell's equations for time varying fields. And explain its relevance in EM propagation.
- (ii) Explain the Significance of Stoke's Theorem.
- (iii) How effective aperture area of the antenna does affect the FRII's transmission Equation?
- (iv) How beam efficiency and Aperture efficiency different?
- (v) List and explain the types of Horn Antenna.

Q.2 a. Design a MSA for a WiFi application (2.4 to 2.4835GHz) using a substrate of dielectric constant of 2.32, of thickness 0.16cm,

10 Marks

b. State Poynting theorem. Derive the expression for Poynting vector and explain significance of each term

10 Marks

Q.3 a. Derive the expression for linear arrays of N elements. Explain the concept of Array Factor

10 Marks

b. Explain types of Reflector Antennas and their feeding techniques

10 Marks

Q.4 a. Differentiate Between Space Wave Propagation and Sky Wave Propagation. Derive the expression of critical and maximum usable frequency w.r.t to sky wave propagation

10 Marks

b. Design a 3-element Yagi Uda Antenna. Explain the parts of the antenna and calculate their length for 3GHz operating frequency

10 Marks

Q.5 a. Derive the expressions for Helmholtz Wave Equation and Explain the condition for wave propagation in Lossless dielectric media

10 Marks

b. Derive the expression for near field and far field equation for a $\lambda/2$ dipole antenna

10 Marks

Q.6 Write a Short Note on any two

20 Marks

a. Bio Savart's Law

b. Helix Antenna

c. Feeding Techniques of MSA
