

**III B. TECH I SEMESTER REGULAR EXAMINATIONS, FEB - 2022**  
**ANTENNAS AND WAVE PROPAGATION**  
**(Electronics And Communication Engineering)**

Time: 3 Hours

Max. Marks: 60

Note: Answer ONE question from each unit (5 × 12 = 60 Marks)

~~~~~

UNIT-I

1. a) Define the following related to Antennas. [6M]  
(i) Gain (ii) Directivity (iii) Efficiency
- b) An 80% efficiency of antenna has power gain 50. Find the [6M]  
directivity gain of the antenna.

(OR)

2. a) What is effective height of the antenna? Derive the expression [6M]  
for effective height?
- b) Explain different field regions of antenna? [6M]

UNIT-II

3. a) Determine the radiation resistance of a small electric dipole [6M]  
antenna?
- b) Prove that the effective heights of transmitting and receiving [6M]  
antennas are same?

(OR)

4. a) Write a short note on Halfwave dipole antenna. [6M]
- b) Explain any one antenna theorem? [6M]

UNIT-III

5. a) Classify the antenna array? Derive the field equation of an N [6M]  
element antenna array?
- b) Derive the field equations of minor lobe maximum and [6M]  
minimum of two-element point source in broadside operating  
mode?

(OR)

6. a) Explain about the Binomial array. [6M]
- b) Derive the condition for maximum directivity in end-fire array? [6M]

UNIT-IV

7. a) Derive and design 7-element Yagi-Uda antenna? [6M]  
b) Give the constructional and operation details of helical antenna with neat sketches? [6M]

(OR)

8. a) Explain various feeds used for parabolic antennas? What is spill-over? [6M]  
b) Explain the measurement of gain by comparison method? [6M]

UNIT-V

9. a) Define Tropospheric propagation and derive the expression for radius of curvature path. [6M]  
b) Explain the features of Sky Wave (Ionosphere) propagation? [6M]

(OR)

10. a) Derive the fundamental equation for free space propagation. [6M]  
b) Explain skip distance with necessary equations? [6M]

\* \* \* \* \*