

(OLD COURSE)**Q.P. Code : 4413****(3 Hours)****[Total Marks : 100**

- N.B.:** (1) Question no. 1 is compulsory
 (2) Answer any four questions from remaining questions.
 (3) Assume suitable data of required.

1. (a) Explain the significance of directivity & radiation pattern of an antenna. 05
- (b) Explain Isotropic, omnidirectional & directional antenna with suitable examples. 05
- (c) Explain radiation pattern of short dipole. 05
- (d) Explain the principle of pattern multiplication with suitable example. 05
2. (a) Derive the expression for vector potential wave equation. 10
- (b) What is folded dipole antenna? Explain its operation, equation & properties. 10
3. (a) Explain in brief the working of helical antenna with neat diagram. 10
- (b) Explain & derive equations for total electric field, directivity, half power beamwidth in case of same amplitude but opposite phase 10
4. (a) Explain important features of loop antenna. Explain how a loop antenna can be used for direction finding. 10
- (b) Explain V antenna & rhombic antenna. List their advantages & disadvantages. Mention their applications. 10
5. (a) A broadside array consists of 4 isotropic sources with distance of $\lambda/2$ between them. Find array factor, directions of major lobe, directions of minor lobe maxima & minima HPBW & FNBW. Plot the pattern. 10
- (b) Explain ducting effect. Under what conditions this effect takes place? 10
6. (a) Explain the following terms :- 10
 - (i) Critical frequency
 - (ii) Virtual height
 - (iii) Maximum usable frequency.
- (b) Explain different types of horn antennas. Find the directivity & beamwidth. 10
7. Write short notes on 20
 - (a) Log periodic antenna.
 - (b) Ground Interference effects.
 - (c) FRISSE Transmission equation
 - (d) Sleeve dipole