

EC - 604**B.E. VI Semester**

Examination, June 2017

Antenna and Wave Propagation**Time : Three Hours****Maximum Marks : 70****Note:** i) Attempt any five questions.

ii) All questions carry equal marks.

1. Derive and explain the relation of radiation from a quarter wave monopole or half wave dipole.
2. A half wave dipole is located parallel to and one quarter wavelength from a plane metallic reflecting sheet. Sketch the lines of current flow in the sheet.
3. Two $\frac{\lambda}{2}$ dipoles are arranged broad side with a spacing of 0.67λ . The value of resistance component of mutual impedance for this spacing is 25 ohms. Calculate the ratio of power radiated by this combination to that of an isolated $\frac{\lambda}{2}$ dipole for the same input current.
4. Using the principle of multiplication pattern, sketch the horizontal pattern of four vertical antennas which is spaced one half wavelength apart and fed with equal currents but with 180 degree phasing between the adjacent elements.

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5. What do you understand by the directive gain of an antenna? Describe with a suitable expression.
6. Define antenna bandwidth and the classification of antenna based on it. What is the importance of antenna VSWR.
7. Write down the relation for weighting functions for antenna array synthesis for any odd number of linear elements.
8. Answer any four of the following:
 - a) Explain the concept of alternating current element in electric dipole.
 - b) Write short note on broad side and end fire array.
 - c) Derive the relationship between antenna gain, effective aperture and effective heights.
 - d) Write down the Taylor synthesis of sum patterns with the help of a suitable example.
 - e) Describe the phenomena of wave tilt of surface waves.
 - f) What is Radio Horizon? How does it differ from optical horizon.

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