Code No: 55022 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD
B. Tech III Year I Semester Examinations, November - 2015
ANTENNAS AND WAVE PROPAGATION
(Common to ECE, ETM)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

1.a) State and prove reciprocity theorem.
b) Explain the following parameters:
i) Radiation intensity, ii) Effective Height of the antenna. [7+8]

2. Derive the field equations of a half wave dipole and prove that the radiation resistance of a half wave dipole is 73 ohm. [15]

3.a) Obtain the array factor of an N-element uniform array.
b) Explain in detail about Binomial array and find the excitation coefficients of a 7 element array. [7+8]

4.a) Explain about the folded dipole and prove that the impedance of double folded is 292 ohm.
b) Explain in detail about horn antenna and write down its design considerations. [8+7]

5.a) Describe the principle of operation of a parabolic reflector antenna and write down the feed methods.
b) Explain in detail about the construction of a patch antenna. [8+7]

6.a) Explain in detail about the working principle of lens antenna.
b) With a neat sketch explain the procedure for the measurement of radiation pattern. [7+8]

7.a) Explain in detail about ground wave propagation and write down the factors effecting ground wave propagation.
b) Find the range of LOS system when the receiver and transmitter antenna heights are 10m and 100m respectively. When effective radius of the earth is considered? [7+8]

8. Write a short note on:
a) Virtual height
b) MUF
c) Layers of ionosphere. [5+5+5]

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