

Code No: 09A50405

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B. Tech III Year I Semester Examinations, May/June – 2013

Antennas and Wave Propagation

(Common to ECE, ETM)

Time: 3 hours

Max. Marks: 75

Answer any five questions  
All questions carry equal marks

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- 1.a) Explain effective aperture and directivity of a short dipole antenna and linear  $\lambda/2$  dipole.
- b) Explain in detail about antenna field zones.
- c) A radio link has a 15W transmitter connected to an antenna of  $2.5\text{m}^2$  effective aperture at 5GHz. The receiving antenna has an effective aperture of  $0.5\text{m}^2$  located at a 15Km LOS distance from the transmitting antenna. Assuming lossless, matched antennas, find the power delivered to the receiver. [8+3+4]
- 2.a) Determine field at any distance from center-fed dipole.
- b) Explain the radiation resistance of loops. [7+8]
3. Determine the field due to
  - a) array of two point sources of same amplitude and in-phase at a distance 'R'.
  - b) array of two point sources of same amplitude and opposite phase at a distance 'R'. [15]
- 4.a) Explain in detail about helical geometry of Helical Antenna.
- b) How to construct a pyramidal horn and draw its radiation pattern. [8+7]
- 5.a) Explain in detail about corner reflector design.
- b) What are the different methods to feed parabolic reflector? Explain them in brief. [7+8]
- 6.a) Explain nonmetallic dielectric antennas.
- b) How to measure gain of Antenna using three Antennas? [7+8]
- 7.a) Explain reduction factor and numerical distance in ground wave propagation.
- b) Explain about super refraction. [8+7]
- 8.a) Explain refraction and reflection of sky waves by ionosphere.
- b) What is duct propagation? Give some examples. [8+7]

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