JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, February/March - 2016
ANTENNAS AND WAVE PROPAGATION
(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

1.a) Explain in detail about restarted vector potential.
 b) Explain in detail about induction field and radiation field and find the distance at which induction and radiation fields are equal.

[7+8]

2.a) Derive the relation between maximum effective aperture and directivity.
 b) Calculate the radiation resistance of a single turn and an 8 turn small circular loop when the radius of the loop is $\lambda/25$ and medium is free space.

[7+8]

3.a) Explain the principle of pattern multiplication and find the radiation pattern for 4 and 8 element array.
 b) Define broad side and end fire arrays and obtain the expression for array factor of linear end fire array of a 4 element.

[7+8]

4.a) Discuss about Helical Antennas.
 b) Explain design consideration of pyramidal horns.

[8+7]

5.a) A 64 meter diameter paraboloid reflector is operated at 1430MHz and is fed by a non-directional antenna. Estimate its beam width between half power points and between nulls and power gain with respect to half wave dipole. Assume even illumination.
 b) Explain in detail about the construction of a patch antenna.

[7+8]

6.a) Derive the equation for the shape of a non-metallic dielectric lens.
 b) Explain the methods for the measurement of gain by using two antenna method and three antenna method.

[7+8]

7.a) Derive the equation of radio horizon of space wave propagation considering earth effective radius.
 b) Discuss in detail about Duct propagation and wave tilt.

[8+7]

8. Write short notes on:
 a) Critical frequency
 b) Skip Distance
 c) Multi-hop propagation.

[5+5+5]

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