

M.Sc.-II (Electronics) (New CBCS Pattern) Semester - IV
PSELT401 - Core-II - Paper-I : Electromagnetic Fields and Antennas

P. Pages : 1

Time : Three Hours



GUG/S/23/11367

Max. Marks : 80

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- Notes : 1. All questions are compulsory and carry equal marks.
2. Draw neat and labelled diagram wherever necessary.

Either :-

1. a) What is a homogenous medium? Derive the expression for the wave equation in free space condition. **8**
b) State and explain the basic Maxwell's equation. **8**

OR

- c) Derive the wave equation for a conducting medium. **8**
d) State and prove Poynting's theorem. **8**

Either :-

2. a) What is radiation of antenna? Explain how it generates. **8**
b) Discuss the radiation resistance of antenna and antenna pattern. **8**

OR

- c) Define the antenna parameter: **8**
i) Radiation intensity ii) Directivity
iii) Gain iv) Resolution
d) Derive the expression for effective aperture for short dipole antenna. **8**

Either :-

3. a) What is short dipole antenna: Derive the expression for electric and magnetic field for short dipole antenna in far field. **8**
b) Explain broad-side and end-fire array. **8**

OR

- c) Explain the Yagi-Uda array antenna with its radiation pattern. **8**
d) Explain the rhombic antenna with suitable diagram and its radiation pattern. **8**

Either :-

4. a) Explain the antenna diversity for base station. **8**
b) State and prove antenna reciprocity theorem. **8**

OR

- c) Explain the switched beam and beam forming antenna. **8**
d) Describe the rectangular microstrip antenna and state its advantages. **8**

5. Attempt the followings:

- a) Write the interpretation of $E \times H$. **4**
b) Differentiate between elliptical and circular polarization. **4**
c) Discuss folded dipole. **4**
d) Discuss measurement of radiation properties of antenna under test (AUT). **4**
