

GUJARAT TECHNOLOGICAL UNIVERSITY
BE – SEMESTER – VI (NEW).EXAMINATION – WINTER 2016

Subject Code: 2163203**Date: 24/10/2016****Subject Name: Engineering Electromagnetics & wave Propagation****Time: 10:30 AM to 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain cylindrical coordinate system. **07**
 (b) Explain cross product and dot product in detail with applications of each. **07**
- Q.2** (a) Derive the expression for the electric field intensity E due to infinite sheet of charge having a uniform density of ρ_s C/m². **07**
 (b) Explain experimental law of Coulomb and derive expression for electric field intensity for point charges using it. **07**
- OR**
- (b) Find electric field intensity due to infinite line with uniform line charge density ρ_l which lies on the z-axis. **07**
- Q.3** (a) Define displacement flux density. Also state and prove Gauss's law. **07**
 (b) State and prove Divergence theorem. **07**
- OR**
- Q.3** (a) State and explain Biot-Savart's law. **07**
 (b) Explain the point form of Ampere's circuital law. **07**
- Q.4** (a) Derive equations to find energy stored in the field of a system of charges. **07**
 (b) What is an electric dipole? Derive the expression for electric field intensity E at a distant point due to the electric dipole. **07**
- OR**
- Q.4** (a) State and prove Uniqueness theorem. **07**
 (b) Write short note on magnetic boundary conditions. **07**
- Q.5** (a) Determine the boundary conditions at a boundary between a conductor and free space. **07**
 (b) Define Lorentz force equation and obtain force on current element using it. **07**
- OR**
- Q.5** (a) Derive Maxwell's four equations in point form. **07**
 (b) State and prove Poynting vector theorem of an electromagnetic field. **07**
