Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–IV • EXAMINATION – WINTER 2013

Subject Code: X40904 **Date: 10-12-2013**

Subject Name: Theory of Electromagnetics

Time: 02.30 pm - 05.00 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)**	What is coordinate system? Also explain unit vectors of Cartesian, Cylindrical and Spherical Coordinate systems.	**07**
	(b)	Describe coulomb's law with necessary equations.	**07**
Q.2	**(a)**	State and explain Gauss's law. Obtain electric field intensity of line charge using Gauss's law.	**07**
	(b)	Explain an electric dipole. Also derive expression E due to an electric dipole.	**07**
		OR	
	(b)	Explain boundary condition for dielectric material.	**07**
Q.3	**(a)**	Write short-note on 'magnetic materials'	**07**
	(b)	State and Explain Stoke's theorem	**07**
		OR	
Q.3	**(a)**	State and Explain Ampere circuital law.	**07**
	(b)	Derive continuity equation of current also explain relaxation time.	**07**
Q.4	**(a)**	State and Explain Lorentz force equation on charge particle.	**07**
	(b)	Discuss Poisson's and Laplace's equation.	**07**
		OR	
Q.4	**(a)**	State and explain Biot-Savart's law.	**07**
	(b)	State Maxwell's equations in point form and explain physical significance of the equations.	**07**
Q.5	**(a)**	State and Explain Induction heating.	**07**
	(b)	Write a note on ferrite core. Also list out various properties of ferrites.	**07**
		OR	
Q.5	**(a)**	Write a short note on advantages and applications of numerical techniques in engineering.	**07**
	(b)	Explain briefly finite element method.	**07**