PAPER CODE- 52003

University Institute of Engineering & Technology

(Recognised Under Section 2(f) and 12B of UGC)

Kurukshetra University, Kurukshetra

Roll No. -

THEORY EXAMINATION – MAY 2019	
B.TECH – Ist year	SEMESTER – 2nd

TIME – 3 Hrs.

M.M. - 75

COURSE NO. - BS-119

COURSE TITLE - Introduction to Electromagnetic Theory

Note: All questions in Part-A and Part-B are compulsory. Attempt any four questions from Part-C selecting at least one from each unit.

PART-A (15 Marks)

Q. No. – 1 Answer the following questions. **15x1=15**

(i)	What is the difference between electric field and electrostatic field?
(ii)	What are the properties of field lines?
(iii)	Write Poisson's equation in electrostatics.
(iv)	What is the unit of electrostatic potential?
(v)	Define atomic polarizability.
(vi)	What is electric susceptibility?
(vii)	What is Polarization?
(viii)	What is dielectric constant?
(ix)	What do you mean by magnetic forces?
(x)	What is magnetic vector potential?
(xi)	Write boundary conditions for Auxiliary magnetic field.
(xii)	What do you understand by magnetic linear materials?
(xiii)	What is unit of inductance?
(xiv)	Write Maxwell's equations in vacuum.
(xv)	Define Faraday's law.

PART-B (20 Marks)

	UNIT-I	
2	Derive an expression for the energy of a point charge distribution in electrostatics.	5
	UNIT-II	
3	State and prove Gauss's law in the presence of dielectrics.	5
	UNIT-III	
4	Find the magnetic field at a distance s from a long straight wire carrying a steady current I.	5
	UNIT-IV	
5	What is motional emf? Prove that relation for emf is same even for non-rectangular loop moving in non-uniform magnetic field.	5

PART-C (40 Marks)

	UNIT-I	
6	What is Electric Potential? Derive an expression for the potential of a localized charge distribution.	10
7	Find the electric field at a distance Z above the midpoint of a straight line segment of Length $2L$, which carries a uniform line charge λ.	10
	UNIT-II	
8	Discuss the field of a polarized object and physical interpretation of bound charges.	10
9	Derive an expression for forces on dielectrics.	10
	UNIT-III	
10	Derive an expression for Multipole expansion of the vector potential.	10
11	Discuss effect of a magnetic field on atomic orbits.	10
	UNIT-IV	
12	Derive an expression for energy in magnetic fields.	10
13	Describe Maxwell's equations in matter.	10