QUESTION PAPER CODE- 54014

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 – Electronics & Communication Engg.	SEMESTER - IV

TIME – 3 Hrs.

M.M. -

PAPER- ECE-206

SUBJECT - 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)	Explain Stokes theorem in electromagnetic.
(ii)	A metal sphere with 1 m radius and surface charge density of 10 Coulombs / m^2 is enclosed in a cube of 10 m side. Calculate the total outward electric displacement normal to the surface of the cube.
(iii)	Explain Ampere's law in electromagnetic.
(iv)	Calculate the divergence of the vector field $\vec{A} = x\hat{a}_x + y\hat{a}_y + z\hat{a}_z$.
(v)	Explain the relation between magnetic flux density and magnetic vector potential.
(vi)	The incoming solar radiation at a place on the surface of the earth is 1.2 KW/m^2. Find the amplitude of the electric field corresponding to this incident power.
(vii)	Mention the criterion to differentiate between good conductor and good dielectric.
(viii)	The expression of electric field intensity is given by $E = (X\ a_x + Y\ a_y + Z\ a_z)$ volt/m, Find the potential difference between X (2, 0, 0) and Y (1, 2, 3).
(ix)	Explain skin depth.
(x)	What do you understand by VSWR?
(xi)	What do you understand by cut off frequency of wave guide?
(xii)	Draw and explain the equivalent model of a transmission line.
(xiii)	Explain poisons and Laplace's equations.
(xiv)	Find the location of point (2,-1,3) in spherical coordinates.
(xv)	Explain uniqueness theorm.

PART-B (20 Marks)

	UNIT-I	
2	Transform the vector $3\,a_x + 4\,a_y + 5\,a_z$ into spherical coordinate.	5
	UNIT-II	
3	Write short note on (a) Magnetic circuits **(b)** Torque on a closed circuit.	5
	UNIT-III	
4	Write short note on Retarded Potential.	5
	UNIT-IV	
5	Write short note on dominant modes in rectangular waveguide.	5

PART-C (40 Marks)

	UNIT-I	
6	Explain the boundary conditions at Interface between two dielectrics.	10
7	Wtite short note on (a) Method of Images and its applications. (b) Gauss's Law and its applications.	10
	UNIT-II	
8	With suitable diagram find the expression of magnetic field due to current flowing in a, linear conductor and in a circular loop.	10
9	Derive and Explain the expression of Maxwell's equations in differential and integral form.	10
	UNIT-III	
10	Derive the expression of wave equation for good conductors. Also derive the expression of Attenuation constant and phase shift constant for wave propagating in good conductors.	10
11	What is the significance of Pointing vector? Derive the expression of Pointing vector.	10
	UNIT-IV	
12	Derive the expression of input impedance of a transmission line terminated with load Impedance Z_l.	10
13	Explain construction and working of rectangular wave guide. What do you understand by TE and TM modes in rectangular waveguide. Also write short note on Excitation of waveguides.	10