Reg. No.													

Question Paper Code	11702

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022

Third Semester

Electrical and Electronics Engineering

20EEPC303 - ELECTROMAGNETIC THEORY

(Regulations 2020)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	What are the sources of electromagnetic fields?	2,K1,CO1
2.	State coulomb's law.	2,K1,CO1
3.	Define dielectric strength.	2,K1,CO2
4.	Define energy density in electrostatic field.	2,K1,CO2
5.	State Ampere's Law.	2,K1,CO3
6.	Define magnetic torque.	2,K1,CO3
7.	State Faraday's law of electromagnetic induction.	2,K1,CO4
8.	What is displacement current?	2,K1,CO4
9.	What is reflection of a plane wave?	2,K1,CO5
10.	Define skin depth.	2,K2,CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Explain all the co-ordinate system?	13,K1,CO1
		OR	
	b)	(i) A circular disc of radius 'a', m is charged uniformly with a charge density of ς C/m2 Find the electric field intensity at a point 'h', m from the disc along its axis.	6,K2,CO1
		(ii) State and explain Gauss's law. Derive an expression for the potential at a point outside a hollow sphere having a uniform charge density.	7,K2,CO1
12.	a)	Derive the electrostatic boundary conditions at the interface of conductor to dielectric media.	13,K2,CO2
		OR	
	b)	A line charge of uniform density q (C / m) extends from the point (0, -a) to the point (0, 1) in the x-y plane. Determine the electric field intensity E at the point (a, 0).	13,K2,CO2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

13. a) Use Biot – Savart's law to find magnetic field intensity for finite length of conductor at a point P on Y – axis. *13,K2,CO3*

OR

b) Derive the expressions of Magnetic field due to circular loop. *13,K2,CO3*

14. a) Derive the Maxwell's Equations in point form and integral form. *13,K2,CO4*

OR

b) (i) Differentiate field theory and circuit theory. *6,K2,CO4*

(ii) Derive an expression for transformer and motional emf. *7,K2,CO4*

15. a) Derive the plane wave equation in good conductor. *13,K2,CO5*

OR

b) Derive the electromagnetic wave equation for electric field for free space. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Derive the expressions of Magnetic field due to conductor. *15,K2,CO3*

OR

b) (i) State & explain Poynting vector? Derive pointing theorem. *8,K2,CO5*

(ii) Derive the plane wave equation in loss less dielectric. *7,K2,CO5*