Code No: P18EET02

R18

HALL TICKET NUMBER

PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE
(AUTONOMOUS)
II B.TECH I SEMESTER END SUPPLEMENTARY EXAMINATIONS, JAN - 2023
ELECTRO MAGNETIC FIELDS
(EEE Branch)

Time: 3 hours Max. Marks: 60

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

Answer all the questions in Part-A (5X2=10M)

Q.No.		Questions	Marks	CO	KL
1	a)	State coulomb's law and mention any two limitations	[2M]	1	2
	b)	What are conductors and insulators?	[2M]	2	1
	c)	Deduce the relation between magnetic flux, magnetic flux density?	[2M]	3	4
	d)	Explain Neuman's formulae?	[2M]	4	2
	e)	State faradays laws of electromagnetic induction?	[2M]	5	2

PART-B

Answer One Question from each UNIT (5X10=50M)

Q.No.		Questions	Marks	CO	KL
		UNIT-I			
2.	a)	Using Gauss law derive the expression for electric field intensity due to infinite length of line charge?	[5M]	1	2
	b)	Two similar conducting spheres have charge of 2.5nC and - 0.5nC respectively. When they are placed 4 cm apart what is the force between them. If they are brought into contact and then separated by 4 cms what is the force between them.	[5M]	1	4
		OR			
3.	a)	Define electric field in terms of point charge and also in terms of potential, mention salient features of electric field intensity.	[5M]	1	2
	b)	Two 6nC point charges are located at (1,0,0)and (-1,0,0) in free space. i) Find V at P(0,0,z) ii) Find Vmax	[5M]	1	4
		UNIT-II			
4.	a)	What is an electric dipole? Obtain expression for torque experienced by an electric dipole in a uniform electric field.	[5M]	2	1
	b)	Derive the expression for Potential gradient.	[5M]	2	3
		OR			
5.	a)	Write the Laplace's and Poisson's equations and their physical significance	[5M]	2	3
	b)	Four 0.8 nC point charges are located in free space at the corners of a square 4 cm on a side. (i)Find the total potential energy stored. (ii) A fifth 0.8 μC charge is installed at the centre of the square. Again, find the total energy stored.	[5M]	2	4
		UNIT-III			
6.	a)	Find the Magnetic Field Intensity due to a straight current carrying filament.	[5M]	3	2
	b)	Find **H** at the centre of an equilateral triangle loop of side 4m carrying 5 A of current lying in x=0 plane and the centroid lies along z axis.	[5M]	3	4
		OR			
7.	a)	Derive Maxwell's second equation?	[5M]	3	3

	b)	State Ampere's circuital law and prove the same.	[5M]	3	3
		UNIT-IV			
8.	a)	Derive the expressions for the self-inductances of a solenoid and a toroid.	[5M]	4	3
	b)	Two parallel current carrying conductors separated by a distance of 4m carries current of 10 A and 15 A in opposite directions. Find the force on each conductor. Find the field intensity at mid-point between the two conductors.	[5M]	4	4
		OR			
9.	a)	Derive the expression for the force between two finite current carrying loops.	[5M]	4	3
	b)	Define and explain Scalar Magnetic potential and its limitations.	[5M]	4	3
		UNIT-V			
10.	a)	Explain Statically and dynamically induced EMFs?	[5M]	5	2
	b)	Explain Poynting Theorem and Poynting vector?	[5M]	5	2
		OR			
11.		Write Maxwell's equations in (i) differential form (ii) integral form. Explain the significance of each equation with examples	[10M]	5	2

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