Q.P. Code: 18EC0412 **R18**

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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations Feb-2021

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 60

PART-A

(Answer all the Questions **5 x 2 = 10** Marks)

1	a	List Maxwell's equations for electrostatic fields.	**2M**
	b	Define magnetic flux density.	**2M**
	c	Define Transformer EMF.	**2M**
	d	Define polarization.	**2M**
	e	What are the primary constants of a transmission line?	**2M**

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Apply Gauss Law to evaluate the electric flux density at a point P due to the point charge located at the origin.	**5M**
	b	A Point Charge 100 pC is located at (4,1,-3) while the x-axis carries charge 2ηC/m. If the Plane z=3 is also carries charge 5ηC/m2, find E at (1,1,1).	**5M**

OR

3	a	Define the Electric Flux Density. Determine the Electric flux density at a point P due to infinite line of uniform Charge density ρL C/m.	**5M**
	b	Point Charges Q1=4μc ,Q2=-5μc and Q3=2 μc are located at (0,0,1).(-6,8,0) and (0,4,-3) respectively find D at the origin.	**5M**

UNIT-II

4	a	Explain Ampere's Circuit Law.	**5M**
	b	Determine the Magnetic Field Intensity due to a infinite sheet current.	**5M**

OR

5	a	Determine the Magnetic Field Density due to Infinite line Current by applying Ampere's Circuit law.	**5M**
	b	List differential and integral form of Maxwell's equation for static EM filed.	**5M**

UNIT-III

6	a	Explain Faraday's laws in Electromagnetic induction.	**5M**
	b	Prove that the Displacement Current Density $t\ D\ J\ D\ \partial\ \partial = .$	**5M**

OR

7		Explain and determine the EMF for the Followings. i) Motional EMF. (ii)Transformer EMF.	**10M**

UNIT-IV

8		Explain the followings with an expression. i) Linear polarization ii) Circular polarization iii) Elliptical polarization	**10M**

OR

9		Evaluate the expressions for reflection coefficient and transmission coefficient by a normal incident wave for a dielectric medium.	**10M**

UNIT-V

10	**a**	Evaluate the equation for Characteristic Impedance of a Transmission line.	**5M**
	b	A telephone line has the following parameters: R =30 Ω/km, G =0 L = 100mH/km, C = 20μF/m. At 1kHz, calculate the characteristic impedance, propagation constant and velocity of the signal.	**5M**

OR

11	**a**	Explain about the smith chart for finding the SWR and Reflection coefficient.	**5M**
	b	List out the applications of smith chart.	**5M**

END