Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Regular Examinations July-2021
ELECTROMAGNETIC THEORY AND TRANSMISSION LINES
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 a Define Coulomb's law and derive the force F that exists between two   L1   6M
      unlike charges.
   b Three Point Charges Q1=1 mc, Q2=2 mc and Q3=-3 mc are respectively   L3   6M
      located at (0,0,4), (-2,6,1) and (3,-4,-8). Calculate the electric force and
      electric field on Q1 due to Q2 and Q3.

OR

2 a Find the electric field at a point P located with a distance of r from an   L1   6M
      infinite sheet with uniform surface charge density of ρ_s C/m^2.
   b A Point Charge of 20ηc is Located at the Origin. Determine the Magnitude   L3   6M
      and direction of the electric field intensity at the Point (1,3,-4).

UNIT-II

3 a Explain Biot-Savart's Law.   L2   6M
   b A Positive Y-axis (Semi Infinite Line with respect to the Origin) Carries a   L3   6M
      Filamentary Current of 2 A in the -ay Direction. Assume it is part of a
      large circuit. Find H at (i) A(2,3,0). (ii) B(3,12,-4).

OR

4 a Explain Ampere's Circuit Law.   L2   6M
   b Determine the Magnetic Field Intensity due to a infinite sheet current.   L5   6M

UNIT-III

5 a Determine the Transformer EMF for the time varying fields.   L5   8M
   b Define Faraday's law?   L1   4M

OR

6 a Explain Faraday's law of electromagnetic induction and derive the   L2   6M
      Expression for Induced EMF.
   b Explain the motional EMF and derive the expression for the maxwell   L2   6M
      equation.

UNIT-IV

7 a Discuss about pointing theorem and poynting vector.   L6   6M
   b Explain and derive the characteristics of wave propagation in free space.   L2   6M

OR

8 a Determine the expression for intrinsic impendence and propagation   L5   6M
      constant in a good conductor.
   b Evaluate the wave equation in lossy dielectric medium for sinusoidal time   L5   6M
      variations.

UNIT-V

9	a	Evaluate the equation for voltage and current at any point in a transmission line.	L5	**6M**
	b	Discuss about Transmission line Parameters.	L6	**6M**

OR

10	a	With neat sketch explain about Primary and Secondary constants of transmission line.	L2	**6M**
	b	A low loss transmission line of 100 Ω characteristics impedance is connected to a load of 200 Ω. Calculate the voltage reflection coefficient and the standing wave ratio.	L3	**6M**

*** END ***