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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations February-2022

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 What are the types of Charge Distributions? Determine the Electric Field Intensity Due to infinite Surface Charge. 6M
- b A Point Charge of 20nC is Located at the Origin. Determine the Magnitude and Direction of the electric Field Intensity E at the Point (1, 3, -4). 6M

OR

- 2 Define Capacitance. Write about Different types of Capacitors and derive the expression for Capacitance. 12M

UNIT-II

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

OR

- 4 a Define and Derive Maxwell's Equations for Electric and magnetic Fields. 6M
- b Determine the Magnetic Flux Density due to a Infinite Sheet of Current. 6M

UNIT-III

- 5 a Define the Following Terms 6M
i) Inductance (ii) Mutual Inductance (iii) Generator e.m.f (iv) Magnetic Vector Potential.
- b Show that $\nabla \times \mathbf{H} = \mathbf{J} + \partial \mathbf{D} / \partial t$. 6M

OR

- 6 a Give the reason why ampere's Law is In-consistence and drive displacement current. 6M
- b Derive the Boundary Conditions for time varying Fields. 6M

UNIT-IV

- 7 a What is Polarization and explain the Different types of Polarizations. 6M
- b Calculate the reflection coefficient for vertical polarization with oblique incident on perfect dielectric. 6M

OR

- 8 a Define the Conducting Medium and Obtain the Expression for Intrinsic impedance. 6M
- b Define the following 6M
i) Reflection efficient (ii) Transmission Coefficient (iii) Surface Impedance

UNIT-V

- 9 Explain the Construction of the Smith Chart. 12M

OR

- 10 a Define lossless and Distortion less transmission lines and write the Conditions for both. 6M
- b Obtain the input impedance of Transmission line of length l characterized by Z_0 and γ . 6M

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