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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**B.Tech II Year II Semester Regular and Supplementary Examinations May 2019**
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 the Electric Flux Density. A Point Charge of $30\mu\text{C}$ is located at the origin. While the Plane $y=3$ carries a charge 10nc/m^2 . Find Density at $(0,4,3)$. 8M
- b Define Electric Potential. What is the Relationship Between V and \vec{E} . 4M

OR

- 2 a A Point Charge of 20nc is Located at the Origin .Determine the Magnitude and Direction of the electric Field Intensity \vec{E} at the Point $(1,3,-4)$. 7M
- b Explain the Concept of polarization in Dielectrics. 5M

UNIT-II

- 3 a Determine the Magnetic Field Intensity due to a infinitely long coaxial Transmission line. 6M
- b Explain about Non Existence of Magnetic Mono pole. 6M

OR

- 4 a Determine the Magnetic Flux Density due to a Infinite Sheet of Current. 6M
- b Define and explain about magnetic potentials. 6M

UNIT-III

- 5 a Define and Derive Maxwell's Equations for Electric and magnetic Fields. 7M
- b Explain about Lorentz Force Equation. 5M

OR

- 6 a Explain the Following. 7M
(i) Motional e.m.f (ii)Transformer e.m.f
- b Show that the ratio of the amplitudes of the conduction current density and displacement current density is $\sigma/\omega\epsilon$ for the applied field $\vec{E} = E_m \cos \omega t$. Assume $\mu = \mu_0$. 5M

UNIT-IV

- 7 a What is Polarization? What are the Different types of Polarization? 7M
- b Derive the Relation between \vec{E} and \vec{H} in free Space. 5M

OR

- 8 a Define the Following terms 6M
(i)Uniform plane wave (ii) Skin depth (iii)Critical Angle
- b Define the Conducting Medium and Obtain the Expression for Intrinsic impedance. 6M

UNIT-V

- 9 a A Transmission line operating at 500 MHz has $Z_0=80 \Omega$, $\alpha =0.04 \text{ Np/m}$, $\beta=1.5 \text{ rad/m}$. Find the Line Parameters R,L,G and C. 7M
- b Define lossless and Distortion less transmission lines and write the Conditions for both. 5M

OR

- 10 a Explain the Construction of the Smith Chart. 7M
- b Derive the Expression $Z_0=\text{SQRT}(Z_{OC} Z_{SC})$. 5M

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