

Final 01-11-21

Course Code: 1930204

Roll No:

MLRS- R19



MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

II B.Tech I Sem Supply End Examination, October 2021

ELECTROMAGNETIC FIELDS

(EEE)

Time: 3 Hours.

Max. Marks: 70

Note: 1. Answer any FIVE questions.

2. Each question carries 14 marks and may have a, b as sub questions.

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|---|----|---|-----|-----|-----|
| 1 | a) | State Coulomb's law of force between any two point charges, and indicate the units of the quantities in the force equation. | 7M | C01 | BL3 |
| | b) | Define and explain the following: (i) absolute electric potential (ii) potential difference. | 7M | C01 | BL1 |
| 2 | | Obtain an expression for electric field due to a line charge with uniform charge density of ρ_L coulombs/ meter. | 14M | C01 | BL3 |
| 3 | a) | Show that the energy stored in a capacitor is proportional to its capacitance and square of the voltage across it. | 7M | C02 | BL3 |
| | b) | Obtain an expression for capacitance of a two wire line. | 7M | C02 | BL5 |
| 4 | a) | State and explain Biot-Savart's law. | 7M | C03 | BL4 |
| | b) | Obtain an expression for MFI due to a straight conductor carrying a current. | 7M | C03 | BL5 |
| 5 | a) | Obtain the solution of Laplace equation. | 7M | C02 | BL3 |
| | b) | A wire carrying a current of 100A is bent into a square form, 10 cm sides. Calculate the field at the centre of the coil. | 7M | C03 | BL3 |
| 6 | a) | Obtain the Maxwell's equations in integral form. | 7M | C04 | BL3 |
| | b) | A parallel plate capacitor with the plate area of 5cm^2 and plate separation of 3 mm has a voltage $50\sin 10^3t$ V applied to its plate. Calculate the displacement current assuming $\epsilon=2\epsilon_0$. | 7M | C04 | BL3 |
| 7 | a) | State and explain faradays laws of electromagnetic induction. | 7M | C04 | BL4 |
| | b) | State and explain poynting theorem. | 7M | C05 | BL4 |
| 8 | | Discuss the wave propagation in lossy dielectrics with relevant mathematical expressions. | 14M | C05 | BL2 |

