Lecture Plan for Electro Magnetic Field Theory (IEC-302)

Faculty :   Shrish Bajpai

Section :   EC-2

Web Page : http://sbajpai.yolasite.com/electro-magnetic-field-theory.php

Lecture	Topic	Reference Book
1.	Introduction to the subject with history and developments.	1, 2 & 3
2.	Review of vector and scalar field, different operations and numerical problems	1, 2 & 3
3.	Coordinate systems and transformation : Cartesian and Cylindrical co ordinates & their relationship	1 & 2
4.	Coordinate systems and transformation : Spherical co ordinates & their relationship	1 & 2
5.	Numerical problems on coordinate system	1 & 2
6.	Vector calculus: Differential length, area and volume, line surface and volume integrals	1 & 2
7.	Divergence, Curl & Gradient -1	1 & 2
8.	Divergence, Curl & Gradient - 2	1 & 2
9.	Gauss Divergence & Stoke theorem	1 & 2
10.	Numerical problems on Vector calculus and theorems	1 & 2
11.	Numerical problems in ESE exams of Unit I	1 & 2
12.	Introduction to Electrostatic fields, definition of the electric field, potential, work done & Coulomb law	1 & 2
13.	Mathematical expressions of the electric field due to the line charge, surface charge & volume charge -1	1 & 2
14.	Mathematical expressions of the electric field due to the line charge, surface charge & volume charge – 2 & Electric flux density	1 & 2
15.	Gauss Law of electrostatic and its applications	1 & 2
16.	Boundary conditions & Method of M images	1 & 2
17.	Poisson & Laplace equation	1 & 2
18.	Numerical problems of Unit II	1 & 2
19.	Numerical problems in ESE exams of Unit II	1 & 2
20.	Introduction to Magneto static fields & Biot-Savart's Law	1 & 2
21.	Ampere's circuit law & Ampere law of force	1 & 2
22.	Application of Ampere laws.	1 & 2
23.	Magnetic field due to different type of current carrying conducting wire	1 & 2
24.	Numerical problems	1 & 2
25.	Faraday law & numerical problems	1 & 2

26.	Boundary condition problem of Magneto static fields	1 & 2
27.	Numerical problems of Unit III	1 & 2
28.	Numerical problems in ESE exams of Unit III	1 & 2
29.	Continuity equation & displacement current	1 & 2
30.	Introduction to Maxwell equations - 1	1 & 2
31.	Maxwell Equations - 2	1 & 2
32.	Planer wave in conducting and non conducting medium, phasor notation, phase velocity and group velocity	1 & 2
33.	Depth of penetration & reflection and refraction of the wave	1 & 2
34.	Polarization & it's types, conductors and dielectric	1 & 2
35.	Poynting vector & pointing theorm	1 & 2
36.	Numerical Problems of Unit IV	1 & 2
37.	Numerical Problems of Unit IV	1 & 2
38.	Numerical problems in ESE exams of Unit IV	1 & 2
39.	Introduction to Transmission lines & basic definition terms	1 & 2
40.	Transmission line Equation & Characteristic Impedance	1
41.	Input impedance, standing wave ratio and power, open and short circuit lines	1
42.	Standing wave and reflection losses, Impedance matching	1
43.	Smith chart & guided waves	1
44.	Numerical Problems of Unit V	1
45.	Numerical problems in ESE exams of Unit V	1

Text Book :

1. M. N. O. Sadiku, "Elements of Electromagnetics", Fourth Edition, Oxford University Press. (TBS 621.34 SAD/P)

2. Nathan Ida, "Engineering Electromagnetism", Second Edition, Springer India Private Limited. (TBS 621.34 IDA/E)

3. Rakesh Singh Kshetrimayum, "Electromagnetic Field Theory", Cengage Learning India Publication, First Edition, 2012

4. W. H. Hayt and J. A. Buck, "Electromagnetic field theory", Seventh Edition, McGraw Hill Education.