**Course Plan**

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| --- | --- | --- | --- | --- | --- | --- |
| S.No | Lect  No | Topic to be discussed | Objective of lecture | Outcome of the Lecture | Book Referred | From page to |
| 1 | 1 | Introduction of Magnetic circuits, magneto motive force, Emf | To introduce concept behind magnetic circuits. | Students will be able to Analyze different methods used for magnetic circuits. | Text Book 1 |  |
| 2 | 2 | Magnetic field strength, permeability, reluctance, analogy between electric and magnetic-circuits | Students will be able to Analyze different methods used for magnetic circuits. | Text Book 1 |  |
| 3 | 3 | B-H curve, hysteresis | Students will be able to Analyze different methods used for magnetic circuits. | Text Book 1 |  |
| 4 | 4 | Series and parallel magnetic circuits, | Students will be able to Analyze different methods used for magnetic circuits. | Text Book 1 |  |
| 5 | 5 | Practical magnetic circuits, permanent magnet and their applications. | Students will be able to Analyze different methods used for magnetic circuits. | Text Book 1 |  |
| 6 | 6 | Electromechanical energy conversion: Basic principles | Students will be able to Analyze different methods used for magnetic circuits. | Text Book 1 |  |
| 7 | 7 | Conservation of energy, physical phenomenon involved in conversion, | Students will be able to Analyze different methods used for magnetic circuits. | Text Book 1 |  |
| 8 | 8 | Energy balance, energy stored in magnetic field. | Students will be able to Analyze different methods used for magnetic circuits. | Text Book 1 |  |
| 9 | 9 | DC Generators: Introduction, construction | To intoduce the knowledge of DC generators. | Students will be able to Analyze different methods used for DC generators. | Text Book 1 |  |
| 10 | 10 | types, emf equation, | Students will be able to Analyze different methods used for DC generators. | Text Book 1 |  |
| 11 | 11 | lap and wave windings, | Students will be able to Analyze different methods used for DC generators. | Text Book 1 |  |
| 12 | 12 | armature reaction | Students will be able to Analyze different methods used for DC generators. | Text Book 1 |  |
| 13 | 13 | commutation, methods of improving commutation, | Students will be able to Analyze different methods used for DC generators. | Text Book 1 |  |
| 14 | 14 | Demagnetizing and cross magnetizing ampere turns | Students will be able to Analyze different methods used for DC generators. | Text Book 1 |  |
| 15 | 15 | various characteristics of shunt, series and compound generators, | Students will be able to Analyze different methods used for DC generators. | Text Book 1 |  |
| 16 | 16 | voltage build up, losses and efficiency, condition for maximum efficiency. | Students will be able to Analyze different methods used for DC generators. | Text Book 1 |  |
| 17 | 17 | DC Motors: Introduction, principals, | To intoduce the knowledge of DC motors. | Students will be able to Analyze different methods used for DC Motors. | Text Book 1 |  |
| 18 | 18 | back-emf, torque of motor, types, | Students will be able to Analyze different methods used for DC Motors | Text Book 1 |  |
| 19 | 19 | characteristics of shunt, series and compound motors, | Students will be able to Analyze different methods used for DC Motors | Text Book 1 |  |
| 20 | 20 | speed control (field and armature control methods) | Students will be able to Analyze different methods used for DC Motors | Text Book 1 |  |
| 21 | 21 | basic idea of solid state devices in controlling of DC motors, Starting of DC motors, three point and four point starters, | Students will be able to Analyze different methods used for DC Motors | Text Book 1 |  |
| 22 | 22 | Losses and efficiency, testing (brake test and swimburnes test), electric braking of DC motors, Applications. | Students will be able to Analyze different methods used for DC Motors | Text Book 1 |  |
| 23 | 23 | Transformer: Construction, Principal, | To introduce the concept of transformers. | Students will be able to Analyze different methods used for transformers. | Text Book 1 |  |
| 24 | 24 | Types, emf equation, | Students will be able to Analyze different methods used for transformers. | Text Book 1 |  |
| 25 | 25 | no load and short circuit test, equivalent circuits, | Students will be able to Analyze different methods used for transformers. | Text Book 1 |  |
| 26 | 26 | back-to-back (Sumpner’s test), | Students will be able to Analyze different methods used for transformers. | Text Book 1 |  |
| 27 | 27 | phasor diagram, Voltage regulation | Students will be able to Analyze different methods used for transformers. | Text Book 1 |  |
| 28 | 28 | Efficiency, Condition for maximum efficiency | Students will be able to Analyze different methods used for transformers. | Text Book 1 |  |
| 29 | 29 | all day efficiency | Students will be able to Analyze different methods used for transformers. | Text Book 1 |  |
| 31 | 31 | parallel operation | Students will be able to Analyze different methods used for transformers. | Text Book 1 |  |
| 32 | 32 | auto-transformer | Students will be able to Analyze different methods used for transformers. | Text Book 1 |  |
| 33 | 33 | basic idea of welding transformer, | Students will be able to Analyze different methods used for transformers. | Text Book 1 |  |
| 34 | 34 | current and potential transformer | Students will be able to Analyze different methods used for transformers. | Text Book 1 |  |
| 35 | 35 | ,separation of losses. | Students will be able to Analyze different methods used for transformers. | Text Book 1 |  |
| 36 | 36 | Polyphase Transformer: Construction | To introduce the concept of 3- phase transformers. | Students will be able to Analyze different methods used for 3-phase transformers. | Text Book 1 |  |
| 37 | 37 | Various connections and groups, | Students will be able to Analyze different methods used for 3-phase transformers. | Text Book 1 |  |
| 38 | 38 | choice of connections, | Students will be able to Analyze different methods used for 3-phase transformers. | Text Book 1 |  |
| 39 | 39 | open delta connection Scott connection, | Students will be able to Analyze different methods used for 3-phase transformers. | Text Book 1 |  |
| 40 | 40 | three phase to two phase conversion and vice-versa, Applications | Students will be able to Analyze different methods used for 3-phase transformers. | Text Book 1 |  |
| 41 | 41 | Parallel operation and its conditions | Students will be able to Analyze different methods used for 3-phase transformers. | Text Book 1 |  |
| 42 | 42 | Three to six phase conversion.Excitation phenomenon in transformers | To introduce the concept of 3- phase transformers. | Students will be able to Analyze different methods used for 3-phase transformers. | Text Book 1 |  |
| 43 | 43 | magnetizing harmonic currents and their effects,switching currents in transformers, | Students will be able to Analyze different methods used for 3-phase transformers. | Text Book 1 |  |
| 44 | 44 | inrush of magnetizing current.Three winding transformer. | Students will be able to Analyze different methods used for 3-phase transformers. | Text Book 1 |  |

Hours/week: 3L