

## LESSON PLAN

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| <b>Discipline:</b> Electronics & Telecommunication | <b>Semester:</b> 4 <sup>th</sup> , Summer |
| <b>Subject:</b> Electrical Machine, Theory-1       | <b>No. of Days/week:</b> 04               |

| Week | Class Day | Theory Topics   |
|------|-----------|---|
| 1st  | 1st       | <b>Electrical Material-</b> Properties & uses of different conducting material. |
|      | 2nd       | Properties & use of various insulating materials used electrical engineering    |
|      | 3rd       | Various magnetic materials & their uses.  |
|      | 4th       | <b>DC Generator-</b> Construction of DC Generator                               |
| 2nd  | 1st       | Principle of DC Generator.  |
|      | 2nd       | Classification of DC generator  |
|      | 3rd       | voltage equation of DC generator  |
|      | 4th       | Derive EMF equation & simple problems.  |
| 3rd  | 1st       | Parallel operation of DC generators.  |
|      | 2nd       | Numerical Solving   |
|      | 3dr       | <b>DC Motor-</b> Principle of working of a DC motor                             |
|      | 4th       | Concept of back EMF in DC motor   |
| 4th  | 1st       | Concept of torque of DC Motor   |
|      | 2nd       | Numerical solving   |
|      | 3dr       | Derive equation relating to back EMF, Current, Speed and Torque                 |
|      |           | equation, Numerical Solving   |
|      | 4th       | Class test  |
| 5th  | 1st       | Numerical Solving   |

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|      | 2nd | Classify DC motors  |
|      | 3rd | characteristics of different DC Motor   |
|      | 4th | Application of different DC Motor   |
| 6th  | 1st | Three point stator/static of DC motor by solid State converter  |
|      | 2nd | four point stator/static of DC motor by solid State converter   |
|      | 3rd | Speed of DC motor by field control and armature control method.   |
|      | 4th | Power stages of DC motor & derive Efficiency of a DC motor.   |
| 7th  | 1st | <b>AC Circuits</b> -Mathematical representation of phasors, significant of operator “J” Addition, Subtraction, Multiplication and Division of phasor quantities |
|      | 2nd | AC series circuits containing resistance, inductances and capacitances  |
|      | 3rd | Conception of active, Reactive and apparent power   |
|      | 4th | Q-factor of series circuits & solve related problems  |
| 8th  | 1st | Find the relation of AC Parallel circuits containing Resistances, Inductance and Capacitances   |
|      | 2nd | Q-factor of parallel circuits.  |
|      | 3rd | <b>Transformer</b> - Construction & working principle of transformer  |
|      | 4th | Derive of EMF equation of transformer   |
| 9th  | 1st | voltage transformation ratio  |
|      | 2nd | Numerical Solving   |
|      | 3rd | Discuss Flux, Current, EMF components of transformer and their phasor diagram under no load Condition.  |
|      | 4th | Phasor representation of transformer flux, current EMF primary and secondary Voltages under loaded condition.   |
| 10th | 1st | Types of losses in Single Phase (1- $\phi$ ) Transformer  |
|      | 2nd | Open circuit Test of single phase Transformer   |
|      | 3rd | short-circuit test of single phase Transformer  |
|      | 4th | Numerical Solving on open circuit test  |
| 11th | 1st | Numerical Solving on short circuit test   |

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|      | 2nd | Parallel operation of Transformer, Auto Transformer  |
|      | 3rd | Quiz-2 Test  |
|      | 4th | <b>Induction Motor-</b> Construction feature, types of three-phase induction motor.                        |
| 12th | 1st | Principle of development of rotating magnetic field in the stator  |
|      | 2nd | Establish relationship between synchronous speed, actual speed and slip of induction motor                 |
|      | 3rd | Establish relation between torque, rotor current and power factor.   |
|      | 4th | Explain starting of an induction motor by using DOL starter  |
| 13th | 1st | Explain starting of an induction motor by using Star-Delta stator  |
|      | 2nd | State industrial use of induction motor.   |
|      | 3rd | <b>Single Phase Induction Motor-</b> Construction features of capacitor type single-phase induction motor. |
|      | 4th | Principle of operation of capacitor type single-phase induction motor.                                     |
| 14th | 1st | Construction features of shaded pole type single-phase induction motor.                                    |
|      | 2nd | Principle of operation of shaded pole type single-phase induction motor.                                   |
|      | 3rd | Explain construction & operation of AC series motor.   |
|      | 4th | Concept of alternator, application of alternator   |