

Lesson plan

| Name of Faculty | | Sh. Sandeep Kumar | | |
|--|-----|--|---------------|--|
| Discipline | | Electrical Engineering | | |
| Semester | | 4 th Sem | | |
| Subject | | Electrical Machines-II | | |
| Lesson Plan Duration | | From 14 March 2022 to 28 June 2022 | | |
| Work load [Theory + Practical] Per Week | | [04+02] | | |
| Week | Day | Theory Topic/ Assignment/ Test | Practical Day | Practical |
| 1 st | 1 | Unit1: Rotating Machine: Basic Concepts | Day1 | Starting of DC motor with help of three point and four point starter |
| | 2 | Principle of Energy conversion | | |
| | 3 | Rotating Electrical Machine: definition of electrical machine, generator & motor | | |
| | 4 | Physical concept of torque production: electromagnetic torque, reluctance torque and concept of torque angle | | |
| 2 nd | 1 | reluctance torque | Day1 | To plot the open circuit characteristics (OCC) of separately excited DC generator |
| | 2 | concept of torque angle | | |
| | 3 | generator & motor | | |
| | 4 | definition of electrical machine, generator & motor | | |
| 3 rd | 1 | Energy conversion | Day1 | Revision/ file checking |
| | 2 | electromagnetic torque | | |
| | 3 | Revision of important topics | | |
| | 4 | Problem solution | | |
| 4 th | 1 | 2. DC Machines | Day1 | Measurement of induced EMF of a DC Shunt generator as a function of field current |
| | 2 | Constructional features of DC Machine | | |
| | 3 | Type of windings in DC machine: field and armature windings | | |
| | 4 | Armature windings: lap & wave winding. | | |
| 5 th | 1 | armature winding terminologies | Day1 | Revision/ file checking |
| | 2 | (conductor, turn, coil, coil group, pole pitch, coil span, full-pitched coil, shortpitched coil, back & front-pitch) | | |
| | 3 | Function of the Commutator in Motoring and Generating action | | |
| | 4 | Armature Reaction in DC machine | | |
| 6 th | 1 | Commutation, cause of sparking, method to improve commutation | Day1 | Measurement of terminal voltage of a DC shunt generator as a function of load current. |
| | 2 | Power flow diagram of DC Machines | | |
| | 3 | lap & wave winding. | | |
| | 4 | DC Machine | | |
| 7 th | 1 | Armature windings | Day1 | Revision/ file checking |
| | 2 | flow diagram of DC Machines | | |
| | 3 | Type of windings | | |
| | 4 | 3. DC Generator | | |
| 8 th | 1 | Working principle of DC generator | Day1 | To start DC series motor with two point starter and to observe the speed. |
| | 2 | Induced EMF equation & factors determining the EMF of generator | | |
| | 3 | Electromagnetic torque equation & factors determining the torque | | |

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| | 4 | Relationship between generated EMF and generator terminal voltage | | |
| 9 th | 1 | Types of DC generator | Day 1 | Revision/ file checking |
| | 2 | separately excited | | |
| | 3 | shunt wound, | | |
| | 4 | series wound and compound generator | | |
| 10 th | 1 | (differential or cumulative type generator) | Day 1 | Speed control of DC shunt motor using Armature control method |
| | 2 | Necessary conditions to build up induced EMF in a DC shunt generator | | |
| | 3 | Operating characteristics of separately excited | | Quiz /viva-voice related to electrical machine |
| | 4 | Shunt, Series and Compound DC generator | | |
| 11 th | 1 | Losses in DC Generator, | Day 1 | Revision/ file checking |
| | 2 | Efficiency of DC Generator | | |
| | 3 | Revision of important topics | | |
| | 4 | Problem solution | | |
| 12 th | 1 | 4. DC Motor | Day 1 | Speed control of DC shunt motor using Field control method |
| | 2 | Working principle of DC motor | | |
| | 3 | Back EMF equation and its significance | | |
| | 4 | Torque equation of DC motor | | |
| 13 th | 1 | Equivalent Circuit diagram | Day 1 | Revision/ file checking |
| | 2 | Relationship between back EMF and terminal voltage | | |
| | 3 | Types of DC motors: Series motor, Shunt motor and Compound motor (differential and cumulative) | | |
| | 4 | Need of Starter, 3-point Starter, 4-point Starter | | |
| | 1 | Speed control of DC series and shunt motors: Armature & Field control methods and Ward Leonard method. | Day 1 | Determination of the effect Measurement of the speed of a DC shunt motor as a function of load torque |
| | 2 | Operating characteristics of DC motors: Shunt, Series and Compound motors. | | |
| | 3 | Effect of armature resistance on Torque-speed curve, | | |
| | 4 | Losses in DC motor | | |
| 14 th | 1 | Efficiency of DC motor: Direct method (direct mechanical loading method), | Day 1 | Determination of efficiency of DC motor by Swinburne's Test. |
| | 2 | Indirect method (Swinburne's method) and regenerative method (Hopkison's method) | | |
| | 3 | 5 Applications and Maintenance of DC Machine | | |
| | 4 | DC generator applications | | |
| | 1 | DC motor applications | Day 1 | Quiz /viva-voice related to electrical machine |
| | 2 | DC Machines (motor & generator) testing and maintenance | | |
| | 3 | | | |
| | 4 | | | |

Signature
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Signature
9/14/3/22