

ACADEMIC LESSON PLAN OF WINTER 2023

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| Discipline: ELECTRICAL | Semester: 5 TH Sem Sec A | Name of the Teaching Faculty: Amit Kumar Bisoyi |
| Subject: ENERGY CONVERSION– II | No. of days/per week class allotted: 4p/week | Semester From: 1 st Aug 2023 to 30 th Nov 2023 No. of Weeks: 17 weeks |
| 1 st | 1 st | Unit-1:ALTERNATOR 1.1 Types of alternator and their constructional features |
| | 2 nd | 1.2 Basic working principle of alternator and establish the relation between speed and frequency |
| | 3 rd | 1.3 Explain terminology in armature winding, and derive expressions for winding factors (Pitch factor, Distribution factor). |
| | 4 th | 1.4 Explain harmonics, its causes and impact on winding factor. |
| 2 nd | 1 st | 1.5 Derive E.M.F equation. (Solve numerical problems (contd.)) |
| | 2 nd | 1.5 Derive E.M.F equation. (Solve numerical problems |
| | 3 rd | 1.6 Explain Armature reaction and its effect on emf at different pf of load (contd.) |
| | 4 th | 1.6 Explain Armature reaction and its effect on emf at different pf of load. |
| 3 rd | 1 st | 1.7 Draw the vector diagram of loaded alternator. (Solve numerical problems) |
| | 2 nd | 1.8 State and explain testing of alternator (open circuit and short circuit methods) (Solve numerical problems).(contd.) |
| | 3 rd | 1.8 State and explain testing of alternator (open circuit and short circuit methods) (Solve numerical problems). |
| | 4 th | 1.9 Determination of voltage regulation of Alternator by direct loading and synchronous impedance method |
| 4 th | 1 st | 1.10 Explain parallel operation of alternator using synchro-scope, dark and bright lamp method |
| | 2 nd | 1.11 Explain distribution of load by parallel connected alternators |
| | 3 rd | Unit-2:SYNCHRONOUS MOTOR 2.1 Explain constructional feature of Synchronous Motor. 2.2 Explain principles of operation, concept of load angle. |
| | 4 th | 2.3 Explain effect of varying load with constant excitation(cont..) |
| 5 th | 1 st | 2.3 Explain effect of varying load with constant excitation |
| | 2 nd | 2.4 Explain effect of varying excitation with constant load. |
| | 3 rd | 2.5 Derive torque, power developed(cont..) |
| | 4 th | 2.5 Derive torque, power developed. 2.6 Explain power angle characteristics of cylindrical rotor motor. |
| 6 th | 1 st | 2.7 Explain effect of excitation on Armature current and power factor. 2.8 Explain Hunting & function of Damper Bars. |
| | 2 nd | 2.9 Describe method of starting of Synchronous motor.(cont..) |
| | 3 rd | 2.9 Describe method of starting of Synchronous motor. 2.10 State application of synchronous motor |
| | 4 th | Unit-3: THREE PHASE INDUCTION MOTOR 3. 1 Explain and derive production of rotating magnetic field. |
| 7 th | 1 st | 3. 2 Explain constructional feature of Squirrel cage and Slip ring induction motor. |
| | 2 nd | 3. 3 Explain principles of operation of 3-phase Induction motor. |
| | 3 rd | 3. 4 Explain slip speed, slip and slip relation with rotor quantities |
| | 4 th | 3. 5 Derive Torque during starting and running and conditions for maximum torque. (solve numerical problems) (contd.) |
| 8 th | 1 st | 3. 5 Derive Torque during starting and running and conditions for maximum torque. (solve numerical problems) |
| | 2 nd | 3. 6 Derive Torque-slip characteristics |
| | 3 rd | 3. 7 Derive relation between full load torque and starting torque etc. (solve numerical problems). |
| | 4 th | 3. 8 Determine the relations between Rotor Copper loss, Rotor output and Gross Torque, and relationship of slip with rotor copper loss. (solve |

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| | | numerical problems) |
| 9 th | 1 st | 3. 9 Explain and state Methods of starting and different types of starters |
| | 2 nd | 3. 10 Explain speed control by Voltage Control, Rotor resistance control, pole changing, frequency control methods. |
| | 3 rd | 3. 11 Describe plugging applicable to three phase induction motor |
| | 4 th | 3. 12 Describe different types of motor enclosures |
| 10 th | 1 st | 3. 13 Explain principle of Induction Generator and state its applications |
| | 2 nd | Unit-4:SINGLE PHASE INDUCTION MOTOR. 4.1 Explain Rotating – field theory of 1-phase induction motor. |
| | 3 rd | 4.2 Explain Ferrari’s principle. |
| | 4 th | 4.3 Explain Working principle, Torque speed characteristics, performance characteristics and application of following single phase motors 4.3.1 Split phase motor. |
| 11 th | 1 st | 4.3.2 Capacitor Start motor. |
| | 2 nd | 4.3.3 Capacitor start, capacitor run motor |
| | 3 rd | 4.3.4 Permanent capacitor type motor |
| | 4 th | 4.3.5 Shaded pole motor |
| 12 th | 1 st | 4.4 Explain the method to change the direction of rotation of above motors |
| | 2 nd | Unit-5:COMMUTATOR MOTORS 5.1 Explain construction, working principle, running characteristic and application of singlephase series motor (contd.) |
| | 3 rd | 5.1 Explain construction, working principle, running characteristic and application of singlephase series motor. |
| | 4 th | 5.2 Explain construction, working principle and application of Universal motors. (contd.) |
| 13 th | 1 st | 5.2 Explain construction, working principle and application of Universal motors. |
| | 2 nd | 5.3 Explain working principle of Repulsion start Motor, Repulsion start Induction run motor, Repulsion Induction motor.(cont..) |
| | 3 rd | 5.3 Explain working principle of Repulsion start Motor, Repulsion start Induction run motor, Repulsion Induction motor. |
| | 4 th | Unit-6:SPECIAL ELECTRICAL MACHINE 6.1 Principle of Stepper motor. |
| 14 th | 1 st | 6.2 Classification of Stepper motor. 6.3 Principle of variable reluctant stepper motor. |
| | 2 nd | 6.4 Principle of Permanent magnet stepper motor. |
| | 3 rd | 6.5 Principle of hybrid stepper motor. |
| | 4 th | 6.6 Applications of Stepper motor. |
| 15 th | 1 st | Unit-7: THREE PHASE TRANSFORMERS 7.1 Explain Grouping of winding, Advantages |
| | 2 nd | 7.2 Explain parallel operation of the three phase transformers. |
| | 3 rd | 7.3 Explain tap changer (On/Off load tap changing |
| | 4 th | 7.4 State maintenance of Transformers |
| 16 th | 1 st | REVISION CLASS |
| | 2 nd | REVISION CLASS |
| | 3 rd | REVISION CLASS |
| | 4 th | REVISION CLASS |
| 17 th | 1 st | REVISION CLASS |
| | 2 nd | REVISION CLASS |
| | 3 rd | REVISION CLASS |
| | 4 th | REVISION CLASS |

Anil Kumar Prisoji

Signature of Teaching Faculty

