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| **Name of the Faculty: Mr. Parveen Kamboj****Discipline : Electrical Engineering****Semester : 4th****Subject : Electrical Machines-II** **Duration : 15 weeks(from15 February 2024 to June 2024)****Work load (Lecture/Practical) per week (in Hours):Lecture-03,Practical -04** |  |
| **Week** | **Day** | **Topic** | **Practical** |
| 1 | 1 | Introduction Of The Subject, Its Need, Applications | **1**. To Plot relationship between no load terminal voltage and excitation current in a synchronous generator at constant speed  |
| 2 | Synchronous Machines  |  |
| 3 | 1.1 Main constructional features of synchronous machine including commutator |  |
| 2 | 4 | 1.2 Generation of three phase emf | 2. Determination of the relationship between the terminal voltage and load current of an alternator, keeping excitation and speed constant. |
| 5 | 1.3 Production of rotating magnetic field in a three phase winding |  |
| 6 | 1.4 E.M.F. Equation, Concept of distribution factor and coil span factor |  |
| 3 | 7 | 1.5 Operation of single synchronous machine independently supplying a load, voltage regulation by synchronous impedance method | 3. Determination of the efficiency of alternator from the open circuit and short circuit test. |
| 8 | 1.6 Need and necessary conditions of parallel operation of alternators, synchronizing an alternator (Synchroscope method) with the bus bars |  |
| 9 | 1.7 Operation of synchronous machine as motor, Starting methods of Synchronous Motor |  |
| 4 | 10 | 1.8 Concept and Cause of hunting and its prevention | 4. Parallel operation of three phase alternators. |
| 11 | 1.9 Specification of Synchronous Machine |  |
| 12 | 1.10 Cooling of synchronous machines |  |
| 5 | 13 | 1.11 Application of synchronous machines (as a synchronous condenser) | 5. Study of ISI/BIS code for 3-phase induction motors.  |
| 14 | Assignment No 01 |  |
| 15 | Test No.01 |  |
| 6 | 16 | Three Phase Induction Motors 2.13 Cogging and Crawling in Induction Motors. | 6. Perform at least two tests on a 3-phase induction motor as per BIS code. |
| 17 | 2.1 Salient constructional features of 3 phase squirrel cage and slip ring induction motors |  |
| 18 | 2.2 Principle of operation, slip and its significance |  |
| 7 | 19 | 2.3 Locking of rotor and stator fields | 7. To reverse the direction of rotation of three phase induction motor. |
| 20 | 2.4 Rotor resistance, inductance, e.m.f. and current |  |
| 21 | 2.5 Relationship between copper loss and the motor slip |  |
| 8 | 22 | 2.6 Power flow diagram of an induction motor | 8. To control speed of three phase induction motor. |
| 23 | 2.7 Factors determining the torque |  |
| 24 | 2.8 Torque-slip curve, stable and unstable zones |  |
| 9 | 25 | 2.9 Effect of rotor resistance upon the torque slip relationship | 9. Determination of efficiency of three phase induction motor by (a) No load test and blocked rotor test. (b) Direct loading (refer BIS code). |
| 26 | 2.10 Starting of 3-phase induction motors by DOL, star-delta and auto transformer starter |  |
| 27 | 2.11 Causes of low power factor of induction motors |  |
| 10 | 28 | 2.12 Speed control of induction motor | **10**. Determination of effect of rotor resistance on torque speed curve of an induction motor. |
| 29 | Assignment No 02 |  |
| 30 | Test No.02 |  |
| 11 | 31 | Single Phase Induction Motors:  |  |
| 32 | 3.1 Single phase induction motors; Construction characteristics and applications | 11. To Plot Torque-Slip Characteristics of three phase induction Motor. |
| 33 | 3.2 Nature of field produced in single phase induction motor |  |
| 12 | 34 | 3.3 Split phase induction motor: Capacitors start and run motor, Shaded pole motor and Reluctance start motor | 12. Study of performance of a ceiling fan with and without capacitor |
| 35 | 3.4 Alternating current series motor and universal motors |  |
| 36 | Assignment No.03 |  |
| 13 | 37 | Special Purpose Machines  | .13. Study the effect of change in capacitor on the performance of single phase induction motor |
| 38 | 4.1 Working principle of Linear induction motor, Stepper motor and Servomotor |  |
| 39 | 4.2 Introduction to Energy efficient Motors. |  |
| 14 | 40 | Test No. 03 | . |
| 41 | Revison of Unit I | 14. To reverse the direction of rotation of single phase induction motor |
| 42 | Revison of Unit II |  |
| 15 | 43 | Revison of Unit III |  |
| 44 | Revison of Unit IV | File Checking and Viva |
| 45 | Previous HSBTE Exam Papers Solved | File Checking and Viva |