| **Name of the Faculty: Sh. Anand Kumar****Discipline : Electrical Engineering****Semester : 4th****Subject : Electrical Machines-II** **Duration : 15 weeks(from 15/022024 to june2024)****Work load (Lecture/Practical) per week (in Hours):Lecture-03,Practical -04** |  |
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| **Week** | **Day** | **Topic** | **Practical** |
| 1 | 1 | Introduction Of The Subject, Its Need, Applications | **G1**-Determination of efficiency (a) no load test and blocked rotor test on an induction motor (b) direct loading of an induction motor. |
| 2 | Introduction of Three Phase Induction Motor  | **G2-**Determination of efficiency (a) no load test and blocked rotor test on an induction motor (b) direct loading of an induction motor. |
| 3 | Silent constructional features of Squirrel cage Three Phase Induction Motor |  |
|  | Silent constructional features of Slip Ring Three Phase Induction Motor |  |
| 2 | 1 | Principal of Operation | **G1-**Determination of effect of rotor resistance on torque speed curve of an induction motor. |
| 2 | Slip and its Significance | **G2-**Determination of effect of rotor resistance on torque speed curve of an induction motor. |
| 3 | Locking of rotor and stator fields |  |
|  | Rotor resistance and inductance |  |
| 3 | 1 | EMF and Current | **G1-**Observe the performance of a ceiling fan without capacitorDetermine the effect of change in capacitor on the performance of 1-phase induction motor and reverse the direction of motor. |
| 2 | Relationship between rotor copper losses ,slip and rotor input power | **G2-**Observe the performance of a ceiling fan without capacitorDetermine the effect of change in capacitor on the performance of 1-phase induction motor and reverse the direction of motor. |
| 3 | Power flow diagram of a Induction Motor |  |
|  | Factors determining the torque |  |
| 4 | 1 | Torque slip Curve, stable and unstable zones | **G1-**To plot relationship between no load terminal voltage and excitation current in a synchronous generator at constant speed. |
| 2 | Effect of rotor resistance upon the Torque slip Curve | **G2-**To plot relationship between no load terminal voltage and excitation current in a synchronous generator at constant speed. |
| 3 | Double cage rotor motor and its applications |  |
|  | Starting of Three Phase Induction Motor |  |
| 5 | 1 | DOL,Star-delta and Auto transformer | **G1-**Determination of the relationship between the voltage and load current of an Alternator, keeping excitation and speed constant. |
| 2 | Causes of Low power factor of induction motors | **G2-**Determination of the relationship between the voltage and load current of an Alternator, keeping excitation and speed constant. |
| 3 | Testing of Three Phase Induction Motor |  |
|  | No-Load and Blocked rotor test |  |
| 6 | 1 | Efficiency of Three Phase Induction Motor | **G1-**To find the efficiency and regulation of Alternator from open & short circuit. Test. |
| 2 | Method of speed control of Three Phase Induction Motor | **G2-**To find the efficiency and regulation of Alternator from open & short circuit. Test. |
| 3 | Harmonics and its effect |  |
|  | Cogging and crawling in Induction Motors |  |
| 7 | 1 | Specifications and ratings of Three Phase Induction Motor | **G1-**Determination of the effect of variation of excitation on performance of a synchronous Motor. |
| 2 | Introduction of Single phase Induction Motor | **G2-**Determination of the effect of variation of excitation on performance of a synchronous Motor. |
| 3 | Construction, characteristics and specifications |  |
|  | Applications of Single phase Induction Motor |  |
| 8 | 1 | Nature of field produced in Single phase Induction Motor-Double field revolving theory | Copy Checking |
| 2 | Split phase induction Motors |  |
| 3 | Capacitor start, Capacitor Run and Capacitor Start and Run Motors, Shaded Pole Motors |  |
|  | Alternating current series motors and universal Motors-Construction, working principle, operation and applications |  |
| 9 | 1 | Single phase Synchronous Motors | Copy checking |
| 2 | Reluctance Motor |  |
| 3 | Hysteresis Motor |  |
|  | Introduction of Synchronous Machines |  |
| 10 | 1 | Main Constructional features of Synchronous Machines | Copy checking |
| 2 | Production of Rotating magnetic fields in three phase windings |  |
| 3 | Generation of Three phase EMF |  |
|  | Concept of Distribution factor and coil Span factor and EMF equation |  |
| 11 | 1 | Armature Reaction at unity, lag and lead Power factor | **G1-**Revison of 1st Practical |
| 2 | Equivalent Circuit diagram of Synchronous Machines | **G2-**Revison of 1st Practical |
| 3 | Concept of voltage regulation |  |
|  | Determination of Voltage regulation by Synchronous Impedance Method |  |
| 12 | 1 | Operation of single Synchronous Machine independently supplying a load  | **G1-**Revison of 2nd& 3rd Practical |
| 2 | Concept of infinite bus bar | **G2-**Revison of 2nd& 3rd Practical |
| 3 | Need and necessary conditions of parallel operation of alternators |  |
|  | Synchronizing an Alternator with bus bars. |  |
| 13 | 1 | Operation of Synchronous Machines as a Motor-its starting methods | **G1-**Revison of 4th Practical |
| 2 | Effect of change in Excitation of a Synchronous Motor | **G2-**Revison of 4th Practical |
| 3 | V-Curves |  |
|  | Concept of Synchronous Condenser |  |
| 14 | 1 | Concept and cause of Hunting and its prevention | **G1-**Revison of 5th& 6th Practical |
| 2 | Specification ,ratings and cooling of  Synchronous Machines | **G2-**Revison of 5th& 6th Practical |
| 3 | Application of Synchronous Machines |  |
|  | Introduction of Special Purpose machines |  |
| 15 | 1 | Construction, working principle and applications of Linear Induction Motors | **G1-**Revison of 7th Practical |
| 2 | Construction, working principle and applications of Stepper motors |  |
| 3 | Construction, working principle and applications of AC Servomotors | **G2-**Revison of 7th Practical |
|  | Construction, working principle and applications of Submersible Motors |  |