**G V P COLLEGE OF ENGINEERING FOR WOMEN (JG), VISAKHAPATNAM**

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**LECTURE SCHEDULE**

**INSTRUCTOR: M.KRISHNA YEAR: 2017 – 2018**

**CLASS: II B.Tech II Semester BRANCH: EEE SUBJECT: Electrical Machines - II**

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| **UNIT** | **TOPIC** | **No. of Periods** |
| **I** | **3-phase Induction Motors** |  |
|  | Introduction | 1 |
| Construction details of cage and wound rotor machines | 3 |
| Concept of rotating magnetic field | 1 |
| principle of operation - rotor emf and rotor frequency | 2 |
|  | Rotor current and pf at standstill and during running conditions | 1 |
|  | rotor input, rotor copper loss and mechanical power developed and their interrelationship | 1 |
|  | Equivalent circuit of IM and Problems | 1 |
|  | Phasor diagram | 1 |
|  | Total number of periods | **11** |
| **II** | **Characteristics, starting and testing methods of Induction Motors** |  |
|  | Torque equation, expressions for maximum torque and starting torque | 2 |
| Torque slip characteristic and concept double cage and deep bar rotors | 1 |
| Effect of crawling and cogging on IM operation | 1 |
| speed control of induction motor with V/f method | 2 |
| no load and blocked rotor tests | 1 |
| circle diagram for predetermination of performance | 1 |
| methods of starting – starting current and torque calculations | 2 |
| induction generator operation and problems | 2 |
| Total number of Periods | **12** |
| **III** | **Single Phase Motors** |  |
|  | Introduction Single phase induction motors | 2 |
| Constructional features and equivalent circuit Problem of starting Double revolving field theory | 2 |
| Starting methods | 2 |
| shaded pole motors | 1 |
| AC Series motor. | 1 |
| Total number of periods | **8** |

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| **IV** | **Construction, Operation and Voltage Regulation of Synchronous generator** |  |
|  | Constructional features of non–salient and salient pole type | 2 |
| Armature windings – Distributed and concentrated windings | 1 |
| Distribution, Pitch and winding factors | 2 |
| E.M.F equation–Improvements of waveform | 1 |
| Armature reaction | 1 |
| Voltage regulation by synchronous impedance method– MMFmethod and Potier triangle method | 3 |
| Two reaction analysis of salient pole machines and phasor diagram. | 2 |
| Numerical problems | 1 |
| Total number of Periods | **13** |
| **V** | **Parallel operation of synchronous generators** |  |
|  | Parallel operation with infinite bus and other alternators | 2 |
| Concept Synchronizing power | 1 |
| Load sharing – Control of real and reactive power | 2 |
| Numerical problems | 2 |
| Total Number of periods | **7** |
| **VI** | **Synchronous motor – operation, starting and performance** |  |
|  | Synchronous Motor principle and theory of operation– Phasor diagram | 2 |
| Starting torque Methods of starting – Applications. | 2 |
| Variation of current and power factor with excitation –Synchronous condenser | 2 |
| Mathematical analysis for power developed | 1 |
| Hunting and its suppression and numerical problems | 2 |
| Total Number of periods | **9** |

**Total No. of Periods**: 11+12+8+13+7+9 = 60

**BOOKS:**

1. Electrical Machines – P.S. Bhimbra, Khanna Publishers
2. Electric Machinery by A.E.Fitzgerald,Charleskingsley,StephenD.Umans, TMH
3. Electrical Machines by D. P.Kothari, I .J .Nagarth,McGrawHill Publications, 4th edition