

Drives and control [DC]

B.E. Sem. VIII [ELEC]

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical & Oral	–	25
Oral Exam	–	–
Term Work	–	25

SYLLABUS

1. Electrical Drives

Introduction, Advantages of Electrical Drives, Parts of Electrical Drives, Choice of Electrical Drives, Status of DC and AC Drives

2. Dynamics of Electrical Drives

Fundamental torque equations, Speed torque conventions and multi quadrant operation, Equivalent values of drive parameter, Measurement of moment of inertia, Components of load torques, Nature and classification of load torques, Calculation of Time and Energy-Loss in transient operations, Steady state stability, Load equalization

3. Selection of Motor Power Rating

Thermal Model of motor for heating and cooling, Classes of motor rating, Determination of motor rating.

4. Control of Electrical Drives

Modes of operation, Speed control drive classification, Closed loop control of drives

5. DC Drives

Speed torque relations for shunt, Series and separately excited motors, Starting, Braking – Regenerative, Dynamic, Plugging, Speed control- Armature voltage, Field flux, Armature resistance, Methods of voltage Control – Ward Leonard scheme, Controlled rectifiers, Controlled rectifier fed DC drives(separately excited only)- Single phase fully-controlled rectifier, Single phase half controlled rectifier, three phase fully-controlled rectifier, three phase half-controlled rectifier, dual converter control, Chopper Control – Motoring and braking of separately excited and series motor.

6. AC Drives

Induction Motor drives, Review of speed-torque relations, Review of Starting methods Braking-Regenerative, Plugging, Ac dynamic braking, Speed Control- stator voltage control, variable frequency control form voltage source, Vector Control (Elementary treatment only), Introduction to Synchronous Motor variable speed drives.

7. Special Motor drives

Stepper Motor drives- Types, Torque Vs Stepping rate characteristics, Drive circuits, Introduction to Brushless DC drives, Introduction to Switched reluctance drives

Reference Books :

1. Fundamentals of electrical drives (*Dubey G.K*) Narosa .
2. Electrical Drives: concepts and applications (*Subrahmanyam .V.*) TMH
3. Electric motor drives: modeling, analysis and control (*Krishnan R*) PHI
4. A first course on electrical drives (*Pillai s.k*) willey eastern ph
5. Modern Power electronics and AC Drives (*Bose B.K*) Pearson Education Asia
6. Power electronics: circuits, Devices and Applications (*Rashid M.H*) PHI

