

Paper – V – ELECTRICAL MACHINE TECHNOLOGY

Unit – I: DC Generators and Motors

DC Generators : Types of generators – Series wound generator – Separately excited generator – Shunt wound generator – Condition for self excitation – Compound wound generator – Efficiency of DC machines.

DC Motors: Back e.m.f. – Speed of a DC motor – Condition for maximum power – Armature reaction and commutation – Characteristics of D.C. motors – Motor starters – Speed control of D.C. motor.

Unit – II - Transformers

Transformer – Construction – Transformation ratio – Primary – No load current – Transformer on load – Effect of resistance – Equivalent circuit of static transformer – Testing of transformers – Use of transformers with measuring instruments.

Unit – III: Electronic Control of AC Motors.

Instability of AC motors – Variable speed induction motor drives – Torque speed characteristics of induction motors – Inverters for driving the motor – Speed control of induction motor by variable voltage - fixed frequency supply – Synchronous motor control.

Unit – IV: Alternator and Amplidyne.

Alternator – Construction – Operation – Frequency - Pitch factor and distribution factor – E.M.F. equation of alternator.

Amplidyne – Amplification factor – Use of amplidyne in control – Amplidyne for control of voltage – Amplidyne for control of current.

Unit – V: Industrial Timing Circuits.

Introduction – Constituents of Industrial timing circuits – classification of timers – Thermal timers – Electro mechanical timers – Electronic timers – Classification of electronic timers – RC timing elements – Time base generators – SCR delay timer – IC electronic timer.

Books for Study:

1. Industrial Electronics – G.K. Mithal – Khanna Publishers – Delhi – 15th edition – 1992.
2. Electrical Technology – H. Cotton – CBS Publishers – Delhi.

Books for References:

1. Electrical Technology – B.L. Theraja, A.K. Theraja – NIRJA construction and Development Co(p) Ltd. – Delhi –1989.
2. Electrical and Electronic measurements and Instrumentation – A.K. Sawhney – Dhanpat Rai & Sons -1990.