Syllabus

UNIT – I

Control of DC motors by Single phase Converters: Introduction to Thyristor controlled Drives, Single Phase semi and Fully controlled converters connected to d.c separately excited and d.c series motors – continuous current operation – output voltage and current waveforms – Speed and Torque expressions – Speed – Torque Characteristics- Problems on Converter fed d.c motors.

UNIT - II

Control of DC motors by Three phase Converters: Three phase semi and fully controlled converters connected to d.c separately excited and d.c series motors – output voltage and current waveforms – Speed and Torque expressions – Speed – Torque characteristics – Problems.

UNIT – III

Four Quadrant operation of DC Drives: Introduction to Four quadrant operation Motoring operations, Electric Braking – Plugging, Dynamic and Regenerative Braking operations. Four quadrant operation of D.C motors by dual converters – Closed loop operation of DC motor (Block Diagram Only).

UNIT-IV

Control of DC motors by Choppers: Single quadrant, Two –quadrant and four quadrant chopper fed dc separately excited and series excited motors – Continuous current
operation – Output vltage and current wave forms – Speed torque expressions – speed torque characteristics – Problems on Chopper fed d.c Motors – Closed Loop operation (Block Diagram Only).

UNIT – V

Control of Induction Motor through Stator voltage: Variable voltage characteristics-
Control of Inductin Motor by Ac Voltage Controllers – Waveforms – speed torque characteristics.

UNIT – VI

Control of Induction Motor through Stator Frequency: Variable frequency characteristics-Variable frequency control of induction motor by Voltage source and current source inverter and cyclo converters- PWM control – Comparison of VSI and CSI operations – Speed torque characteristics – numerical problems on induction motor drives– Closed loop operation of induction motor drives (Block Diagram Only).

UNIT –VII

Control of Induction motor of Rotor side: Static rotor resistance control – Slip power
recovery – Static Scherbius drive – Static Kramer Drive – their performance and speed torque characteristics – advantages applications – problems.

UNIT – VIII

Control of Synchronous Motors: Separate control & self control of synchronous motors
– Operation of self controlled synchronous motors by VSI and CSI cycloconverters. Load commutated CSI fed Synchronous Motor – Operation – Waveforms – speed torque characteristics – Applications – Advantages and Numerical Problems – Closed Loop control operation of synchronous motor drives (Block Diagram Only), variable frequency control, Cyclo converter, PWM, VFI, CS