Module 1

Syllabus : Review of diodes, V-I characteristics and applications of : Rectifier diode, Zener diode, LED, Photodiode; SCR V-I characteristics, UJT triggering circuit, Turning-off of a SCR (preliminary discussion), Basics of Gate Turn Off (GTO), Structure and V-I characteristics of Triac (modes of operation not needed) and Diac, Applications of Triac-Diac circuit

Syllabus : Characteristics of power BJT, Power MOSFET, IGBT; Comparison of SCR, Triac, Power BJT, Power MOSFET, IGBT.

Syllabus : Block diagram of closed loop speed control of DC motors, Block diagrams including rectifier and inverter for speed control of AC motors (frequency control only).

Syllabus : Operational amplifier circuits, Ideal OPAMP behaviour, Common OPAMP ICs; Basic OPAMP circuits, Inverting amplifier, Non-inverting amplifier, Voltage follower (Buffer), Comparator, Instrumentation amplifier, Power OPAMPs.

Module 5

Syllabus : Overview of generic microprocessor, architecture and functional block diagram, Comparison of microprocessor and microcontroller MSP430 architecture, Assembly language programming,

C compiler programming, basics of interfacing with external input / output devices (like reading external analog voltages, digital input output).

Applications of microcontroller : Temperature measurement, Speed measurement using Proximity Sensor, Piezoelectric Actuator Drive.

Module 6

Syllabus : Review and comparison of DC motors and AC induction motors, Basic principle of speed control of AC induction motor, Basics of BLDC motor, Linear actuator motor, Servo motor; Motor specifications, Suitability of each motor for various industrial applications, Selection and sizing of motors for different applications, Applications for pumps, Conveyors, Machine tools, Microcontroller based speed control for induction motor.

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