

33072- PROGRAMMABLE LOGIC CONTROLLER

DETAILED SYLLABUS

UNIT- I INTRODUCTION TO PLC

Automation – Types of Automation (manufacturing and NonManufacturing) – Advantages of automation - PLC Introduction - Definition – Block diagram of PLC – Principle of operation – Modes of operating – PLC Scan - Hardwire control system compared with PLC system - Advantages and Disadvantages of PLCs – Criteria for selection of suitable PLC –Memory organization – Input Types – Discrete input – Analog in/out - Elements of Power supply unit - PLC Types (Fixed I/O and Modular I/O) - List of various PLCs available – Applications of PLC.

UNIT- II INPUT/OUTPUT MODULES

The I/O Section - Discrete I/O modules(DC and AC) – Analog I/O modules - Special I/O Modules– I/O Module Specification - Typical Discrete and Analog I/O field Devices –Sensors – Limit switch – Reed switch – Proximity sensor (Inductive and Capacitive) – Types of Photo Electric Sensor - Sinking and Sourcing I/O modules–TTL output module – Relay output module –Isolated output module - Input/output Addressing scheme in important commercial PLCs.

UNIT- III PLC PROGRAMMING

Types of programming methods – Types of programming devices – Logic Functions – AND Logic – OR Logic – NOT Logic - Relay type instructions –Timer Instructions – ON Delay and OFF Delay Timer – Retentive Timer Instruction – Cascading Timers – Counter Instruction – UP Counter – DOWN Counter – UP/DOWN Counter – Cascading Counters – Program Control Instructions –Data Manipulation Instruction – Data Compare Instructions – Math Instructions - Sequencer Instructions - PID Instruction – PWM Function – Simple programs using above instructions. Develop ladder logic for: Bottle filling system – Automatic car parking system - EB to Generator Changeover system – Batch process – Elevator system - Automatic Star-Delta Starter – Traffic light control.

UNIT- IV NETWORKING

Levels of industrial network – Network Topology –Network Protocol – OSI Reference Model - Networking with TCP / IP Protocol - I/O Bus networks – Block diagram of I/O Bus networks – Types of I/O Bus networks - Protocol standards – Advantages of I/O Bus networks - Gateway

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Notes
Syllabus
Question Papers
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– Token passing – Data Highway – Serial Communication – DeviceNet – ControlNet – EtherNet – Modbus – Fieldbus – ProfibusSubnetting – Subnet mask - File transfer protocol.

UNIT- V DATA ACQUISITION SYSTEMS

Computers in Process control – Types of processes - Structure of control system – ON/OFF Control – Closed loop control - PID Control – Motion Control –Block diagram of Direct Digital Control - Supervisory Control and Data Acquisition (SCADA)–Block diagram of SCADA – Features of SCADA – Functions of SCADA - SCADA software - Data Loggers – Tags – Alarms - landlines for SCADA – use of modems in SCADA.