Annexure-9

Syllabus for the post of Technician Gr.-III
Notification Sl. No. **8**
Qualification – Diploma in Mechatronics

Basic electrical and electronics engineering

- Electricity and DC circuits
- Electromagnetism and DC generators
- AC fundamentals, transformers and AC generators
- Electric motor drives
- Protective devices, UPS and estimation
- Electronic components and applications

Analog & digital electronics

- Dc regulated power supply
- BJT biasing and amplifiers
- Op-amp and applications
- Active filters and instrumentation amplifier
- Wave-shaping circuits
- Sinusoidal oscillators
- Number systems and codes
- Basic logic circuits
- Arithmetic circuits
- Combinational logic circuits
- Basic sequential circuits
- Registers and counters
- D to A and A to C converters
- Memories and programmable devices
- Digital integrated circuits

Fluid power engineering

- Introduction to fluid power
- Properties of hydraulic fluids
- Energy and power in hydraulic systems
- Basics of hydraulic flow in pipes
- The distribution system
- Pneumatic system and physical units
- Basic requirements for pneumatic system and pipeline layout
- Air compressor and servicing compressed air
- Pneumatic cylinders and pneumatic actuators
- The source of hydraulic power - pumps

- Fluid power actuators
- Pneumatic valves
- Hydropneumatics

Microcontroller and applications

- Introduction to microcontroller
- Architecture of MCS 8051
- Introduction to 8051 program development tools
- Instruction set and programming of 8051
- Applications of MCS-8051 hardware
- Arduino microcontroller

Manufacturing technology

- Casting technology
- Conventional machining
- Lathe machine
- Drilling and milling machine
- Non-traditional machining
- Powder metallurgy and additive manufacturing
- Computer Numerical Control (CNC)

Measurement system

- Sensors and transducers
- Signal conditioning
- Data acquisition system
- Display and recording devices

Power electronics

- Power semiconductor devices
- Power semiconductor circuits
- Power and power distribution system
- Industrial electrical diagrams
- Motor control devices and circuits
- Magnets, solenoids, relays, timers and counters (8 hrs)
- Motors for control applications
- Speed control of motors and motor control circuits

Materials for engineering

- Basics of Engineering Materials
- Steels and Alloys

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- Non-Ferrous metals and alloys
- Non-Metallic and advanced materials
- Heat treatment processes
- Surface treatment for materials

Programmable logic controller

- Introduction to industrial automation
- Basic PLC programming
- PLC arithmetic and timer functions
- PLC counter functions
- Data handling functions and shift registers
- Advanced plc operations and introduction to embedded system

Automotive electronics

- Introduction to automobiles
- Charging & starting systems
- Ignition & engine management systems
- Chassis electrical systems
- Comfort and safety systems
- Introduction to EV

Industrial automation and robotics

- Introduction to industrial automation
- Flexible manufacturing system
- Fundamentals of robotics
- Basic elements of robot system
- Vision systems in robotics
- Programming in robot
- Applications of robot

Computer Integrated Manufacturing System

- CIM and automation
- CNC machines
- Group technology
- Automated shop floor control
- Automated material handling
- Flexible manufacturing system