



Entrance Syllabus for:

- **Post Diploma in Automation & Process Control**
- **Post Diploma in Mechatronics**

1. **Basics of Physics**

Laws of Motion: Force and inertia, Newton's Second Law of motion; Impulse: Newton's Second Law of motion, Law of conservation of linear momentum and its applications, Equilibrium of concurrent forces. Static and Kinetic friction, Laws of friction, rolling friction. Dynamics of uniform circular motion: Centripetal force and its applications.

Work, energy and power: Work done by a constant force and a variable force; kinetic and potential energies, work energy theorem, power. Potential energy of a spring, conservation of mechanical energy, conservative and non-conservative forces; Elastic and inelastic collisions in one and two dimensions.

2. **Basic Electrical Engineering**

Fundamentals and AC Theory: Concept of Source and Load, Ohm's Law, Concept of resistance, Series and Parallel DC circuits, Kirchhoff's Laws, Faraday's Laws of Electromagnetic Induction, Fleming's Left Hand Rule and Right-Hand Rule. Difference between DC and AC, Amplitude, Cycle, Time period, Frequency, Phase, Phase Angle, Phase Difference, Instantaneous value, RMS value, Average value, Amplitude factor and Form factor, AC through pure resistance, inductance and capacitance, AC through RL, RC and RLC circuits, Impedance Triangle and Power Triangle.

Conversion of Electrical Energy: DC machine and its main parts. DC generators: Principle of operation and emf equation. DC motors: Principle of operation, classification, Starters used for DC motors, Use of different types of DC generators and motors, Principle of operation of Three-phase and Single-phase Induction Motors.

3. **Basic Electronics Engineering**

Electronic Devices:

Classification of material according to electrical conductivity (Conductor, Semiconductor & Insulator) with respect to energy band diagram only. Principle of working and use of PN junction diode, Zener diode and Light Emitting Diode (LED), Basics of Digital Electronics.

4. **Quantitative Aptitude & Logical Reasoning**

Alphanumeric series, Blood Relations, Coding-Decoding, Decision Making, Deductive Reasoning, Dices, Directions, Odd One Out, Picture Series and Sequences, Paper Folding, Puzzles, Pattern Series and Sequences, Order & Ranking, Seating Arrangements, Syllogism.



POST DIPLOMA IN CNC TECHNOLOGY SYLLABUS:

| BASIC ENGG. DRAWING | WORKSHOP TECHNOLOGY | STRENGTH OF MATERIAL | ADVANCED MANUFACTURING AND CAD/CAM. |
|--|---|---|---|
| 1. Introduction and demonstration 2. Types of lines, lettering & dimensioning 3. Scales 03 4. Curves 06 5. Orthographic projections 6. Section and developments 7. Isometric projections | 1. Fitting. 2. Sheet metal. 3. Welding. 4. Manual machine (Lathe, Milling, Grinding etc) 5. Exposure to CNC milling / Lathe machine | 1. Simple stress & strain 2. Thin cylinder and spherical shell under internal pressure 3. Two-dimensional stress systems 4. Bending moment & shear force 5. Theory of simple bending 6. Combined direct & bending stresses | 1. Non-conventional machining process 2. Automation 3. Numerical control 4. Robot technology 5. Flexible manufacturing system (FMS) 6. CAD / CAM |

EXAM PATTERN

| SECTIONS | TOTAL NUMBER OF QUESTIONS | TOTAL MARKS PER SECTION |
|------------------------------------|---------------------------|-------------------------|
| BASIC ENGG. DRAWING | 10 | 10 |
| WORKSHOP TECHNOLOGY | 15 | 15 |
| STRENGTH OF MATERIAL. | 10 | 10 |
| ADVANCED MANUFACTURING AND CAD/CAM | 15 | 15 |
| TOTAL | 50 No's | 50 marks |

PAPER PATTERN

| PARTICULARS | DETAILS |
|-------------------|--|
| Time Duration | 60 Minutes |
| Type of Questions | Multiple Choice Questions (MCQs) |
| Marking Scheme | 1 Mark for every correct answers , no negative marking for incorrect answers |



POST DIPLOMA IN WATER TECHNOLOGY:

- ❖ **Basic Electrical Engineering:** The basic principles of electricity • The basic principles of electrical systems • The basics of electrical control of machines and actuators • The protection methods of electrical systems • The dangers/hazards of electrical systems • Analytical techniques for fault finding • Strategies for problem solving • Strategies for energy efficiency.
- ❖ **Mechanical Engineering:** The basics of materials (metals, composites, plastics, etc.) • The basics in processing methods of different materials • The basics of connection technology • The basics of mechanical engineering (mechanics, sealing methods, gear technology, etc.) • Criteria and methods for testing equipment and systems • Analytical techniques for fault finding • Techniques and options for making mechanical repairs.
- ❖ **Chemical Engineering:** The basics and principles of solvents and solution preparation, mixing and dilution, including basics calculation • The proper use of each specific glassware, analytical equipment or instrument • The basics and principles of sample pre-treatment, storage, sample preserving and sample taking • Basic principles of chemical analysis • Basic principles of biological analysis • Basic operation/function of laboratory equipment.
- ❖ **Environment Protection:** The logical sequence of network flow and purification steps • The hazardous aspects/points for the environment (danger/risk analysis) • Different mitigation methods • The basic calculations required within water and wastewater network and treatment processes • New trends in environmental processes and protection.
- ❖ **Automation Technology:** The basic principles of sensor technology • The basic principles and functionality of closed loop technology • The basic principles of actuators • The basic principles of control technology • Analytical techniques for fault finding and solving
- ❖ **Health and safety measures:** Basics principles and practices of hygiene • Risk assessment for (biological, chemical, electrical, thermal and mechanical-operations) • Health and work-related regulations • The meaning of relevant danger and safety symbols • Health maintaining regulations, personal protection equipment (PPE)