

**UNIT I****Chapter 1 : Introduction to Hydraulic and Pneumatic System 1-1 to 1-28****Syllabus :**

- 1.1 General layout of oil hydraulics and pneumatic system
- 1.2 Applications, merits limitations of oil hydraulic and pneumatics system.
- 1.3 Properties of fluids, ISO and SAE grades of oil.
- 1.4 ISO symbols used in hydraulic and pneumatic system.
- 1.5 Hazards and safety in Industrial hydraulic and Pneumatics.

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- 2.1 Classification of pumps.
- 2.2 Construction and working of Gear, Vane, Screw, piston pumps (axial and radial).
- 2.3 Performance characteristics and Selection of Pumps.
- 2.4 Classification of Hydraulic and Pneumatic actuators.
- 2.5 Construction and working of Linear and rotary actuators (Motors).

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UNIT III

Chapter 3 : Control Valves

3-1 to 3-30

Syllabus :

- 3.1 Classification of Control valves.
- 3.2 Pressure control valves - relief, unloading, sequence, counter balance, pressure reducing valves.
- 3.3 Direction control valves - Check valve, 2/2, 3/2, 4/2, 4/3, 5/2, 5/3 D.C. Valves used in Hydraulics and Pneumatics.
- 3.4 Standard centre positions, Methods of actuation.
- 3.5 Flow control valves - Non-compensated, Pressure and temperature compensated.

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5.3	Regenerative, counterbalance, sequencing circuits, synchronizing, two pump unloading.
5.4	Hydraulic circuits for Milling machine, Grinding machine, Shaper machine, slotting machine.
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- 6.1 Direct / Indirect Control of Single and Double Acting Air cylinders, motors.
- 6.2 Speed control circuit for cylinders and motors.
- 6.3 Sequencing circuits, Logic AND/OR circuits, Time delay circuits, piston continuous back and forth.
- 6.4 Simple Hydro-pneumatic applications.
- 6.5 Simple Electro-Pneumatic circuits.
- 6.6 Remedies and fault detection in Pneumatic circuits
- 6.7 Maintenance of hydraulic and Pneumatic systems.

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