

For Syllabus, Question Papers, Notes & many More

MF5001 FLUID POWER AUTOMATION

DETAILED SYLLABUS

UNIT I INTRODUCTION

Need for Automation, Hydraulic & Pneumatic Comparison – ISO symbols for fluid power elements, Hydraulic, pneumatics – Selection criteria.

UNIT II FLUID POWER GENERATING/UTILIZING ELEMENTS

Hydraulic pumps and motor gears, vane, piston pumps-motors-selection and specification- Drive characteristics – Linear actuator – Types, mounting details, cushioning – power packs – construction. Reservoir capacity, heat dissipation, accumulators – standard circuit symbols, circuit (flow) analysis.

UNIT III CONTROL AND REGULATION ELEMENTS

Direction flow and pressure control valves- Methods of actuation, types, sizing of ports- pressure and temperature compensation, overlapped and underlapped spool valves- operating characteristicselectro hydraulic servo valves- Different types-characteristics and performance.

UNIT IV CIRCUIT DESIGN

Typical industrial hydraulic circuits- Design methodology – Ladder diagram-cascade, method-truth table-Karnaugh map method-sequencing circuits-combinational and logic circuit.

UNIT V ELECTRO PNEUMATICS & ELECTRONIC CONTROL OF HYDRAULIC AND PNEUMATIC CIRCUITS

Electrical control of pneumatic and hydraulic circuits-use of relays, timers, counters, Ladder diagram. Programmable logic control of Hydraulics Pneumatics circuits, PLC ladder diagram for various circuits, motion controllers, use of field busses in circuits. Electronic drive circuits for various Motors.

For Syllabus, Question Papers, Notes & many More

REFERENCES

1. Antony Esposito, Fluid Power Systems and control Prentice-Hall, 1988.
2. Dudley. A. Peace, Basic Fluid Power, Prentice Hall Inc, 1967.
3. E.C.Fitch and J.B.Suryaatmadyn. Introduction to fluid logic, McGraw Hill, 1978.
4. Herbert R. Merritt, Hydraulic control systems, John Wiley & Sons, Newyork, 1967.
5. Peter Rohner, Fluid Power Logic Circuit Design, Mcmelan Prem, 1994.
6. Peter Rohner, Fluid Power logic circuit design. The Macmillan Press Ltd.,London, 1979.
7. W.Bolton, Mechatronics, Electronic control systems in Mechanical and Electrical Engineering Pearson Education, 2003.

OBJECTIVES

- To make the students to learn the basic concepts of hydraulics and pneumatics and their controlling elements in the area of manufacturing process.
- To train the students in designing the hydraulic and pneumatic circuits using various design procedures.