AMPR11 FLUID POWER DRIVES AND CONTROL

UNIT-1 INTRODUCTION TO FLUID POWER & HYDRAULICS PRINCIPLE

1.1 Introduction to fluid power controls- Hydraulics and pneumatics
1.2 Selection criteria, Application of Fluid power,
1.3 Application of Pascal's Law, equation, Transmission and multiplication of force
1.4 Pressure Losses- Fluids, selection & properties- ISO symbols.

UNIT-2 FLUID POWER DRIVES

2.1 Fluid Power drives- Pumps- working principle and construction details of Gear, vane and piston pumps, Hydraulic motors,
2.2 Hydrostatic transmission drives and characteristics,
2.3 Hydraulic supply components Pneumatic power supply- compressors, air distribution, air motors.

UNIT-3 FLUID POWER ELEMENTS

3.1 Control valves- pressure, flow, direction- working principle and construction- Special type-valves
3.2 Cartridge, modular, proportional, and servo- Selection and actuation methods.
3.3 Actuators- Selection and specification, cylinders, mounting, cushioning, pipe fittings- Fluid conditioning elements- Accumulators.

UNIT-4 HYDRAULIC AND PNEUMATIC CIRCUITS DESIGN

4.1 Design of Hydraulic and pneumatic circuits for automation, selection and specification of circuit components, sequencing circuits, cascade, and karnaugh
4.2 Veitch map method- Regenerative, speed control, synchronizing circuits.

UNIT-5 ELECTRO PNEUMATICS AND PLC CIRCUITS

5.1 Use of electrical timers, switches, solenoid, relays, proximity sensors etc.
5.2 Electro pneumatic sequencing Ladder diagram- PLC- elements, functions and selection
5.3 PLC programming- Ladder and different programming methods- Sequencing circuits.

Reference Books:

1. William W.Reaves, "Technology of Fluid Power", Delmer Publishers, 1997.
2. Petor Rohner, "Fluid Power Logic circuit", Design Macmillon Press Ltd., 1990.
3. Andrew Parr "Hydraulics & Pneumatics, Jaico Publishing House, 2004