AMICE06 PNEUMATIC AND HYDRAULIC SYSYTEMS

UNIT-1 COMPARISON OF PNEUMATICS, FLUIDICS AND ELECTRONICS

1.1 Pneumatic power supply compressor schemes of instrument air production
1.2 Distribution filters- regulators.

UNIT-2 STEADY STATE FLOW OF IDEAL GASES

2.1 Weight flow equation- Mach number- orifice.
2.2 Nozzle and valve flow calculation- discharge coefficient- capillary flow
2.3 Viscous flow equations with parallel plates, circular tube
2.4 Flow of real gases- linearized flow equations.

UNIT-3 STEADY STATE ANALYSIS OF PNEUMATIC COMPONENTS

3.1 Multiple restrictions, volume calculation sensing chamber- valves-alternators
3.2 Transients in pneumatic systems pneumatic cylinders- speed control spool valves
3.3 Directional control valves- popped valves- slide valves- solenoid valves
3.4 Quick exhaust valve- brief survey of other types of valves and associated components.

UNIT-4 PNEUMATIC CONTROL CIRCUITS AND SYSTEMS

4.1 Manual control of pneumatic cylinders
4.2 Use of five and four port valves and their characteristics
4.3 Pilot operated circuits- sequence operation of two cylinders- three and more cylinders

UNIT-5 ELEMENTS OF HYDRAULIC SYSTEMS

5.1 Advantages and disadvantages- service properties of hydraulic fluids
5.2 Qualities of an ideal hydraulic fluid- additives
5.3 Filters and strainers- fluid seals – hydraulic symbols
5.4 Hydraulic accumulators- fluid power pumps hydraulic jack- hydraulic lift.

References Books:

1. W.A.Blaine- Analysis and design of Pneumatic system- John Wiley and sons
2. S.C. Rangwala- Fluid Mechanics- Charotar Publishing House
3. F.K.Kay- Pneumatic Circuit Design- Machinery Publishing Company.