



B.E./B.Tech (Full-Time) DEGREE END SEMESTER EXAMINATION, NOV/DEC 2011
Mechanical Engineering Branch
SIXTH Semester- REGULATIONS 2004

ME 372 – HYDRAULICS AND PNEUMATICS

Time : Three hours

Maximum : 100 marks

Answer ALL questions

Part A – (10 × 2 = 20 marks)

1. What does the bulk modulus of a fluid measure?
2. How do you classify direction control valves?
3. Draw a graphic symbol of 3/2 normally closed DCV.
4. What are the functions of an accumulator?
5. How do you select meter-out flow control valve for a hydraulic system?
6. What do you mean by sequencing circuit?
7. What do you mean by 'fluid logic control device'?
8. What are the benefits of low cost automation?
9. What is the use of relay coil in electro-fluid power systems?
10. How are 'fluidic devices' actuated?

Part B – (5 × 16 = 80 marks)

- 11.a) i Why is cushioning needed in a hydraulic cylinder? Using simple sketch explain the operation of cushioned type hydraulic cylinder. (8)
- ii Compare the advantages and limitations of hydraulic and pneumatic systems. (8)

12.a) Explain the working principle of bent axis and swash plate type piston pump.

(Or)

b) Using simple diagram explain the working method of the following DCV types:

- i) Pilot-to-close check valve
- ii) Shuttle valve
- iii) Mechanically actuated 4/2 valve and
- iv) Solenoid-actuated, 4/3 spring centered valve

13.a) With neat diagram and graphic symbol of reservoir, strainer and filter, explain the need of these components in hydraulic circuits

(Or)

b) Develop a clamp and bend circuit and explain its function.

14.a) What is the purpose of a shuttle and quick exhaust valve in pneumatic circuits? Draw the graphic symbol, label the ports, and describe its operation.

(Or)

b) Name each four causes of the following trouble in a pneumatic system (i) low or erratic pressure, (ii) erratic or slow motion of actuator, (iii) no pressure and (iv) overheating of the fluid.