B.E/ B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS APRIL/MAY 2011

MECHANICAL ENGINEERING BRANCH

FIFTH SEMESTER – (REGULATIONS 2008)

ME 9303 HYDRAULICS AND PNEUMATICS

Time: 3 hours Max. Marks : 100

Answer all Questions

PART-A (10 x 2 =20)

1. Differentiate between absolute and kinematic viscosity.
2. What are the applications of Pascal law?
3. What is lobe pump?
4. Suggest some methods to control pump noise level.
5. Draw a graphic symbol of pressure reducing and unloading valve.
6. Define pressure intensification.
7. What is ladder diagram?
8. What are the advantages of fluidics system?
9. State the role of PLC in fluid power.
10. What is low cost automation?

PART-B (5 x 16 =80)

11. Describe the operation of Hydraulic press circuit. What is the advantage of a hydraulic press system with a pressure compensated pump over a system with a relief valve alone? (10+6)

12.a) Identify the various components of the circuit as shown in figure and explain its operation. Also highlight the importance of the circuit.

(Or)

b) i) A hydraulic motor has a 82 cm^3 volumetric displacement. If it has a pressure rating of 70 bar and it receives oil from a 36 lpm theoretical flow rate pump, find the motor speed, motor theoretical torque and power (10)

ii) A cylinder with a bore diameter of 63 mm and rod diameter of 25 mm is to be used in a system with a 45 lpm pump. What are the extension speeds when regenerating and when not regenerating? (6)

13 a) Describe the difference between a resistive and a tractive load? What type of flow control valve is preferred for each? Explain with suitable hydraulic circuit.

(Or)

b) What is the purpose of an intensifier? What is gained and lost in intensifier? With suitable diagram explain the operation of double-acting pressure intensifier.

14 a) Draw a graphic symbol for the following pneumatic valves (i) check valve (ii) shuttle valve (iii) AND valve (iv) quick exhaust valve. Discuss the purpose of each in pneumatic system.

(Or)

b) Develop a continuious cylinder reciprocation circuit using suitable pneumatic valves.

15. a) With symbol and truth table explain briefly the operation of Basic flip-flop and SRT flip-flop.

(Or)

b) Design and explain the fluid power circuit for a drilling machine to discuss the following functions. (i) clamping the work piece (ii) drilling the work piece (iii) undamping the work piece.

Q.No. 12 a