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10ME73

Seventh Semester B.E. Degree Examination, Dec.2014/Jan.2015

Hydraulics and Pneumatics

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1
 - a. State Pascal's law. Explain with neat sketch, the basic hydraulic power system. (06 Marks)
 - b. Explain the construction and working of Balanced Vane Pump. (08 Marks)
 - c. A Vane has a rotor of diameter 50 mm, a cam ring of diameter 80 mm and the vane of width 40 mm. Compute the volumetric displacement if the eccentricity is 10 mm. (06 Marks)
- 2
 - a. With sketch briefly explain linear hydraulic actuators. (06 Marks)
 - b. Explain with neat sketch the operation of Swash Plate Piston motor in hydraulic system. (05 Marks)
 - c. A hydraulic motor has a volumetric displacement of 123 cm³ operating at a pressure of 60 bar and speed 1800 rpm. If the actual flow rate consumed by the motor is 0.004 m³/sec and the actual torque delivered by the motor is 100 Nm. Find: i) Volumetric efficiency, ii) Mechanical efficiency, iii) Overall efficiency. (09 Marks)
- 3
 - a. Explain with a neat sketch the working of four way, two position directional control valve with symbolic representation. (06 Marks)
 - b. Explain with a neat sketch construction and operation of simple pressure relief valve. (07 Marks)
 - c. Explain briefly with neat sketch working of pressure compensated flow control valve. (07 Marks)
- 4
 - a. Explain with a neat circuit diagram the working of a regenerative circuit. (08 Marks)
 - b. Explain with a neat circuit working of a sequencing circuit in a drilling machine. (08 Marks)
 - c. What are hydraulic accumulators? Classify the accumulators used in hydraulic system. (04 Marks)

PART – B

- 5
 - a. Explain any five desirable properties of a hydraulic fluid. (10 Marks)
 - b. What are the functions of reservoir system? Explain briefly with neat sketch construction of reservoir system. (10 Marks)
- 6
 - a. Explain the characteristics of compressed air. (06 Marks)
 - b. Define pneumatic system. Give the difference between hydraulic and pneumatic system. (06 Marks)
 - c. Explain end position cushioning in pneumatic cylinder with diagram. (08 Marks)
- 7
 - a. Explain with a neat sketch control of extension of a double acting cylinder using logic gates. (10 Marks)
 - b. Explain with a neat sketch construction and operation of a typical quick exhaust valve to increase the actuation speed of a cylinder in a pneumatic system. (10 Marks)
- 8
 - a. Explain with a neat diagram coordinated sequence motion of two cylinders. (10 Marks)
 - b. Write a short note on air dryer and air filter. (10 Marks)
