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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 cm^3 operating at a pressure of 60 bar and speed 1800 rpm. If the actual flow rate consumed by the motor is 0.004 m^3/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. **(04 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)**

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