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10ME73

Seventh Semester B.E. Degree Examination, Dec.2016/Jan.2017
Hydraulics and Pneumatics

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART – A

- 1
 - a. State Pascal's law. Explain its applications, with a neat sketch. (04 Marks)
 - b. Explain the working of unbalanced vane pump. Also obtain an expression for its theoretical discharge. (10 Marks)
 - c. A pump having a displacement of 25cm^3 , operates with a pressure of 250 bar and speed of 1390 rpm. Volumetric efficiency of 0.85 and mechanical efficiency of 0.80. Calculate
 - i) Pump delivery in LPM
 - ii) Input power at pump shaft in KW
 - iii) Drive Torque at pump shaft. (06 Marks)
- 2
 - a. With a neat sketches, explain First, Second and Third class lever system. (06 Marks)
 - b. An 8 cm diameter hydraulic cylinder has 4cm diameter rod. If the cylinder receives the flow at 100 LPM and 12MPa. Find
 - i) Extension and Retraction speeds
 - ii) Extension and Retraction load carrying capacities. (04 Marks)
 - c. Explain with a neat sketch :
 - i) Balanced vane motor
 - ii) Swash plate piston motor. (10 Marks)
- 3
 - a. Explain the working principle of pilot operated check valve with a neat sketch. Illustrate the graphical symbol of the valve (10 Marks)
 - b. Explain with the aid of sketches :
 - i) Non – compensated flow control valve
 - ii) Compensated flow control valve. (10 Marks)
- 4
 - a. Explain the following :
 - i) Meter In and Meter Out circuit
 - ii) Classification of accumulator and explain any 2 types. (10 Marks)
 - b. With a neat sketch, explain Hydraulic circuit for sequencing of Two cylinders. (10 Marks)

PART – B

- 5
 - a. How are hydraulic seals classified? Explain positive and non positive seals. (06 Marks)
 - b. With the aid of sketches, explain the following :
 - i) Return line filtering
 - ii) Suction line filtering
 - iii) Pressure line filtering. (06 Marks)
 - c. Sketch and explain the "Reservoir System". (08 Marks)
- 6
 - a. Differentiate between Hydraulic and Pneumatic systems. (05 Marks)
 - b. Sketch and explain the cushion assembly for a pneumatic cylinder. (07 Marks)
 - c. Write short notes on :
 - i) Cylinder mounting arrangement
 - ii) Rod less cylinder. (08 Marks)
- 7
 - a. Explain with a suitable circuit diagram :
 - i) Shuttle valve
 - ii) Quick exhaust valve. (10 Marks)
 - b. Briefly explain the following :
 - i) OR gate
 - ii) AND gate. (10 Marks)
- 8 Write short notes on :
 - a. Solenoids.
 - b. Air Driers.
 - c. Air filters.
 - d. Motion Diagrams. (20 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.