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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.***

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.

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)**

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