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10ME73

Seventh Semester B.E. Degree Examination, June/July 2016
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. Sketch and explain structure of a hydraulic control system. **(06 Marks)**

b. Explain the construction and working of a external gear pump. **(07 Marks)**

c. Determine the volumetric efficiency of a gear pump of external diameter and internal diameter of gears 75 mm and 50 mm respectively and width of gear teeth 50 mm, if the actual discharge is 30 LPM at 1800 rpm [LPM = Liters per min]. **(07 Marks)**

2 a. Sketch and explain the working of a swash plate type piston motor. **(06 Marks)**

b. Sketch and explain double acting cylinder. **(06 Marks)**

c. A hydraulic motor has a volumetric displacement of 123 cm^3. If it receives 0.0009 m^3/sec of oil at 50 bars.
Find (i) Speed of the motor (ii) Theoritical torque (iii) Theoretical power of the motor. **(08 Marks)**

3 a. Briefly classify valves based on the type of function performed. **(04 Marks)**

b. Sketch and explain the constructional features of poppet valve. **(08 Marks)**

c. Sketch and explain pressure Compensated flow control valve. **(08 Marks)**

4 a. Sketch and explain the operation of a hydraulic circuit for the control of a spring return-single acting cylinder. **(06 Marks)**

b. What is regenerative circuit? Sketch schematically regenerative circuit to increase the extension speed of a double acting cylinder. **(06 Marks)**

c. What are hydraulic accumulators? Sketch and explain dead weight or gravity accumulator. **(08 Marks)**

PART – B

5 a. What are the desirable properties of hydraulic oil? Explain them. **(08 Marks)**

b. What are the main functions and secondary functions of a reservoir? Classify them. **(06 Marks)**

c. Sketch and explain full flow filter. **(06 Marks)**

6 a. What are the characteristics of compressed air? Explain them. **(06 Marks)**

b. Sketch and explain structure of pneumatic control system. **(08 Marks)**

c. Sketch and explain rodless cylinder. **(06 Marks)**

7 a. What are flow control valves? Draw graphical symbols for F.C.V. **(04 Marks)**

b. Sketch and explain construction and principle of operation of a quick exhaust valve. **(08 Marks)**

c. Sketch and explain pressure dependent control circuit. **(08 Marks)**

8 a. Explain the principle of cascade control system. **(06 Marks)**

b. List advantages of solenoid controlled pilot operated directional control valve. **(04 Marks)**

c. List different types of compressor. Explain with a neat sketch production of compressed air. **(10 Marks)**

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