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10ME73

Seventh Semester B.E. Degree Examination, June/July 2018
Hydraulic & Pneumatics

Time: 3 hrs.

Max. Marks: 100

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

PART – A

- 1 a. State Pascal's law. (02 Marks)
- b. With a neat diagram, explain the working principle of a typical hydraulic gear pump. (08 Marks)
- c. An axial piston pump running at 2500 rpm. It has 9 number of 15 mm dia. pistons arranged on 120 mm pitch circle diameter and volumetric efficiency is 90%. Find the offset angle of the pump. (10 Marks)
- 2 a. What is an actuator? State its broad classification. (03 Marks)
- b. Explain the following single acting cylinders with neat sketches (any three):
 (i) Gravity type. (ii) Spring type. (iii) Telescopic
 (iv) Tandem. (09 Marks)
- c. A hydraulic motor has a volumetric displacement of 123 cm³. Operating at a pressure of 60 bars and speed of 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 all three efficiencies and actual power delivered by the motor. (08 Marks)
- 3 a. How control valves are classified? (03 Marks)
- b. Explain with a neat sketch the working of a Direct Acting Pressure Relief valve. (07 Marks)
- c. Describe the working of $\frac{5}{3}$ DC valve with 4 ways with neat sketches. Also draw its graphical symbol. (10 Marks)
- 4 a. What is the principle and purpose of a regenerative circuit? Explain the working of a typical regenerative circuit with a neat sketch. (10 Marks)
- b. What is an accumulator? Explain with a neat circuit diagram the use of accumulator as a hydraulic shock absorber. (10 Marks)

PART – B

- 5 a. What is a seal and what are its functions? Explain sealing devices used in hydraulic systems. (10 Marks)
- b. What is filter and how they are classified? (04 Marks)
- c. Explain the possible situations of incorrect flow with its reasons and remedies. (06 Marks)
- 6 a. What is cushioning of cylinders? Why Cushioning is necessary? Explain the working of a typical cushioned cylinder. (10 Marks)
- b. Explain the different operational type principles used for the construction of Rodless cylinders. (10 Marks)

- 7 a. Explain the different methods employed for controlling the speed of pneumatic cylinder with neat sketches. (10 Marks)
- b. What is the function of a time-delay valve? Explain the constructional features of a typical time-delay valve with a neat sketch. (10 Marks)
- 8 a. What is signal overlap? Explain the methods of solution to signal overlapping. (08 Marks)
- b. Explain with a neat sketch, the working of air lubrication. (08 Marks)
- c. Explain the different methods of distribution of compressed air. (04 Marks)

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