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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 representative 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)



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- 7 a. Explain the different methods employed for controlling the speed of pneumatic cylinders 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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