

CBCS SCHEME

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15ME72

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019 Fluid Power Systems

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What are the desirable properties of hydraulic fluids explain any five? (08 Marks)
b. Explain types of filtering methods and filters. (08 Marks)

OR

- 2 a. State Pascal's law. Explain Pascal's law applied to hand operated jack. (08 Marks)
b. Explain basic structure of hydraulic system. (08 Marks)

Module-2

- 3 a. Explain pumping theory and what are factors considered for selecting hydraulic pump. (08 Marks)
b. Explain external gear pump. (04 Marks)
c. A gear pump has a 75 mm outside diameter a 50 mm inside diameter and a 25 mm width. If the volumetric efficiency is 90% at rated pressure, what is the corresponding actual flow rate? The pump speed is 1000 rpm. (04 Marks)

OR

- 4 a. Explain balanced vane motor. (04 Marks)
b. Explain Swash plate type piston motor. (04 Marks)
c. A hydraulic motor has a displacement of 130 cm³, operates with a pressure of 105 bar and has a speed of 2000 rpm. If the actual flow rate consumed by the motor is 0.05 m³/s and the actual torque delivered by the motor is 200 N-m, find
(i) Volumetric efficiency
(ii) Mechanical efficiency
(iii) Overall efficiency.
(iv) Power developed by motor in kW. (08 Marks)

Module-3

- 5 a. Explain Pilot operated pressure control valve. (06 Marks)
b. Explain 4-way spool valve. (05 Marks)
c. Explain needle flow control valve. (05 Marks)

OR

- 6 a. Explain regenerative circuit. (06 Marks)
b. Explain hydraulic circuit with accumulator for any one application. (05 Marks)
c. Write symbols for,
(i) Pressure relief valve.
(ii) Pressure reducing valve.
(iii) Counter balance valve. (05 Marks)

Module-4

- 7 a. What are the advantages of Pneumatic system? (05 Marks)
b. Explain cylinder cushioning. (05 Marks)
c. Explain supply air throttling and exhaust air throttling. (06 Marks)

OR

- 8 a. Explain construction of single and double acting cylinder. (06 Marks)
b. Explain FRL circuit. (05 Marks)
c. Explain characteristics of compressed air. (05 Marks)

Module-5

- 9 a. Explain following functions generated in Pneumatic systems,
(i) OR gate (ii) AND gate (iii) NOT gate. (12 Marks)
b. Explain quick exhaust valve with symbol. (04 Marks)

OR

- 10 a. With neat sketch, explain electropneumatic control of double acting cylinder. (08 Marks)
b. Explain with neat sketch coordinated sequence motion of two cylinders. (08 Marks)

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