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 cm^3, 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 m^3/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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