

CBCS SCHEME

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15ME72

Seventh Semester B.E. Degree Examination, Jan./Feb.2021

Fluid Power Systems

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain the components required in a fluid power system with a diagram and list the advantages and applications. (08 Marks)
b. State Pascal's law. Explain its application with a diagram. (08 Marks)

OR

- 2 a. How are hydraulic seats classified? Explain them in brief. (08 Marks)
b. What are the types of contaminants? Explain the sources of contamination. (08 Marks)

Module-2

- 3 a. A pump has a displacement volume of 100 cm^3 . It delivers $1.5 \times 10^{-3} \text{ m}^3/\text{sec}$ at 1000 rpm and 70 bars. If the prime mover input torque is 120 N-m,
(i) What is the overall efficiency of the pump? (08 Marks)
(ii) What is the theoretical torque required to operate the pump? (08 Marks)
b. What are the types of Accumulator? Explain with a neat circuit diagram the use of accumulator as a leakage compensator. (08 Marks)

OR

- 4 a. Explain the operation of a Vane motor with a neat sketch. (08 Marks)
b. Explain single and double acting hydraulic cylinders with diagrams and their graphic symbols. (08 Marks)

Module-3

- 5 a. Explain shuttle valve and check valve with diagrams. (08 Marks)
b. Explain the operation of pressure compensated flow control valve with a neat sketch. (08 Marks)

OR

- 6 a. Explain with a circuit diagram the working of double pump hydraulic system. (08 Marks)
b. Explain with circuit diagrams the working of meter-in and meter-out for controlling of a speed of hydraulic cylinder. (08 Marks)

Module-4

- 7 a. What are the advantages, limitations and applications of pneumatic system? (08 Marks)
b. Explain with a neat diagram the working of a pneumatic cylinder cushioning. (08 Marks)

OR

- 8 a. Explain the working of Quick-exhaust valve with a diagram and an application circuit. (08 Marks)
b. Explain the constructional features of a time-delay valve with a diagram and graphic symbol. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-5

- 9 a. Explain the functions of 'OR' and 'AND' gates with shuttle and twin pressure valves respectively. (08 Marks)
- b. Explain with a neat circuit diagram in controlling of extension of a double acting cylinder using OR and AND logic gates. (08 Marks)

OR

- 10 a. Explain with neat circuit diagram signal elimination by reversing valves. (08 Marks)
- b. Explain the control circuitry for single and double acting cylinders using limit switches. (08 Marks)
