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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  $100 \text{ cm}^3$ . 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)**

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