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15ME72

## Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020 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. Define Pascal's law and its applications. (06 Marks)  
b. Brief the various components of hydraulic system and its fluid power symbol. (06 Marks)  
c. What are the four primary functions of a hydraulic fluid? Name the various fluid properties that a fluid should possess. (04 Marks)

OR

- 2 a. With a neat sketch, explain the working of a hydraulic filter. (06 Marks)  
b. What is the purpose of seals in fluid power system? List the various types of seals used on fluid power system. (06 Marks)  
c. Brief the various advantages of fluid power system. (04 Marks)

### Module-2

- 3 a. With a neat sketch explain the working of external gear pump. (06 Marks)  
b. Classify the various types of accumulators. Explain the construction and working of bladder type of accumulator. (06 Marks)  
c. A vane pump is to have a volumetric displacement of  $82 \text{ cm}^3$ . It has a rotor diameter of 5 cm, a cam ring diameter of 7.5 cm, and a vane width of 4 cm. What must be the eccentricity? What is the maximum volumetric displacement possible? (04 Marks)

OR

- 4 a. Explain the working of hydraulic cylinder cushioning with a neat sketch. (06 Marks)  
b. What are the various types of hydraulic cylinder mountings? Brief them with a neat sketch. (06 Marks)  
c. A hydraulic motor has a  $100 \text{ cm}^3$  volumetric displacement. If it has a pressure rating of 140 bar and receives oil from a  $0.001 \text{ m}^3/\text{sec}$  theoretical flow rate pump, find the motor:  
(i) Speed (ii) Theoretical torque (iii) Theoretical KW power (04 Marks)

### Module-3

- 5 a. Brief the construction feature and working of pressure relief valve. (06 Marks)  
b. Explain the regenerative circuit and its application. (06 Marks)  
c. With a neat sketch brief the working of check valve. (04 Marks)

OR

- 6 a. Explain the working of 4/2 manually operated direction control valve with a neat sketch. (06 Marks)  
b. With a neat circuit explain the working of sequencing hydraulic circuit and its application. (06 Marks)  
c. Explain the working of metering in hydraulic circuit with a suitable sketch. (04 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.



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**Module-4**

- 7 a. Explain the working of pneumatic filter with a neat sketch. (06 Marks)  
b. Brief the various components of pneumatic system and its fluid power symbol. (06 Marks)  
c. Brief the working of quick exhaust valve. (04 Marks)

OR

- 8 a. With a neat sketch explain the construction and working of pneumatic lubricator. (06 Marks)  
b. Explain the working of single vane rotary cinder with a suitable sketch. (06 Marks)  
c. With a neat sketch explain the working of shuttle valve. (04 Marks)

**Module-5**

- 9 a. With a suitable pneumatic circuit, explain the indirect actuation of double acting cylinder using memory valve. (10 Marks)  
b. Explain the controlling of double acting pneumatic cylinder using solenoid operated direction valve with a circuit. (06 Marks)

OR

- 10 a. Explain the sequencing of two cylinders A and B using cascading method circuit for the cylinder sequence  $A^+B^+B^-A^-$ . (10 Marks)  
b. Design a suitable electro pneumatic circuit to control of a double acting cylinder using a single limit switch. (06 Marks)

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