



CBCS SCHEME

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Seventh Semester B.E. Degree Examination, July/August 2022

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. Explain any one application of Pascal's law. (06 Marks)
b. Explain different types of hydraulic fluids. (10 Marks)

OR

- 2 a. Explain different types of filters used in hydraulic system. (06 Marks)
b. Explain sealing devices in fluid power systems. (06 Marks)
c. What are the advantages of fluid power system? (04 Marks)

Module-2

- 3 a. Sketch and explain the working of vane pump. (05 Marks)
b. Explain the selection procedure of hydraulic pump. (04 Marks)
c. A pump has following design data:
Discharge volume = 100 cm^3 , discharge = $0.0015 \text{ m}^3/\text{s}$, speed = 1000 rpm,
working pressure = 70 bar, input torque to prime mover = 120 Nm.
Find: (i) Overall efficiency (ii) Theoretical torque (07 Marks)

OR

- 4 a. A pump supplies oil at $0.0016 \text{ m}^3/\text{s}$ to a 40 mm diameter double acting hydraulic cylinder. If the extending and retracting load is 5000 N and rod diameter is 20 mm, find the:
(i) Hydraulic pressure during extending and retracting
(ii) Piston velocity during extending and retracting
(iii) Cylinder power during extending and retracting. (06 Marks)
b. List the applications of accumulator. (04 Marks)
c. Sketch and explain the second class lever system. (06 Marks)

Module-3

- 5 a. Explain the details of Popet valve with a neat sketch. (04 Marks)
b. Explain the working principle of regenerative valve. (06 Marks)
c. With a neat sketch, explain the solenoid valve. (06 Marks)

OR

- 6 a. Explain the working of double acting hydraulic cylinder with a circuit diagram. (08 Marks)
b. Explain how meter-in circuit is used to control the speed of an actuator. (08 Marks)

Module-4

- 7 a. Explain the end cushioning of pneumatic cylinder. (07 Marks)
b. State the characteristics of compressed air. (04 Marks)
c. Explain the structure of pneumatic system with a block diagram. (05 Marks)

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OR

- 8 a. Draw the different symbols used to represent the components of fluid power system. (08 Marks)
- b. What are the functions of FRL unit in pneumatic system? (03 Marks)
- c. Explain the working principle of shuttle valve with neat sketch and symbol. (05 Marks)

Module-5

- 9 a. Write the symbolic representation of sequence valve and explain briefly the working principle. (06 Marks)
- b. With a neat circuit diagram, explain the cascade control in pneumatic system. (10 Marks)

OR

- 10 a. Explain with a circuit diagram the representation of AND logic functions in pneumatic system. (10 Marks)
- b. What are the differences between Hydraulic System and Pneumatic System? (06 Marks)
