

CBCS SCHEME

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18MT54

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022 Hydraulics and Pneumatics

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Define Pascal's law and explain its relevance to the working of a Hydraulic Jack. (08 Marks)
b. In a hydraulic press, a force of 100N exerted on the small Piston. Determine the upward force on the large Piston. The area of the small Piston is $50 \times 10^2 \text{mm}^2$ and the area of the large Piston is $500 \times 10^2 \text{mm}^2$. Also find the distance moved by large Piston, if the small Piston moves by 100mm. (06 Marks)
c. Discuss on the advantages of using Hydraulic system. (06 Marks)

OR

- 2 a. With a neat drawing explain the Hydraulic system along with function of each part in a Hydraulic system. (08 Marks)
b. With the neat sketches, explain the construction and working of any one type of gear pumps. (08 Marks)
c. Discuss on limitations of Hydraulic system. (04 Marks)

Module-2

- 3 a. Classify the continuous rotation hydraulic motors and explain with neat sketch the construction and working of gear motor. (08 Marks)
b. Why cushioning is needed in a Hydraulic cylinder with a neat sketch, explain Hydraulic cylinder cushions. (08 Marks)
c. Discuss on benefits of cylinder mountings. (04 Marks)

OR

- 4 a. With a neat sketch, Discuss on construction and working of a Poppet valve along with its advantages and disadvantages. (08 Marks)
b. With neat sketch, discuss on construction and working of 4/3 DCV with solenoid actuated in a Hydraulic system. (08 Marks)
c. Symbolically represent below DCV
i) $\frac{4}{2}$ DCV ii) $\frac{4}{3}$ DCV (04 Marks)

Module-3

- 5 a. Define filter, with neat sketch, explain the different location of filters in a Hydraulic system. (08 Marks)
b. What is an Accumulator and explain any one type accumulating with neat sketch. (08 Marks)
c. Explain with neat sketch working of single acting Hydraulic cylinder. (04 Marks)

OR

- 6 a. Explain with neat sketch the working of a regenerative circuit diagram. (08 Marks)
b. Explain with neat sketch the working of a sequencing circuit. (08 Marks)
c. List out the desirable properties of hydraulic oil. (04 Marks)

Module-4

- 7 a. Explain with a neat sketch the structure of pneumatic control system and briefly explain function of each component. (08 Marks)
- b. Discuss on advantages and disadvantages of pneumatic system. (06 Marks)
- c. Explain with sketch the stages of air treatment applied in a pneumatic system. (06 Marks)

OR

- 8 a. Symbolically represent the following pneumatic system components:
- Spring return single acting cylinder.
 - Double acting cylinder with double piston rod
 - Check valve
 - 2/2 poppet valve
 - Flow control valve.
- (10 Marks)
- b. With neat sketch explain the construction and working of double acting pneumatic cylinder. (10 Marks)

**Module-5**

- 9 a. With neat circuit diagram, explain the pressure controlled reversal without limit switch. (10 Marks)
- b. With neat circuit diagram explain the working of sequential control of two double acting cylinder using logic gates. (10 Marks)

OR

- 10 a. Explain cascade method of pneumatic circuit design. (10 Marks)
- b. Explain the motion step diagram for a double acting cylinder. (10 Marks)

