CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐

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.

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-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 $50 \times 10^2 mm^2$ and the area of the large Piston is $500 \times 10^2 mm^2$. 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:

- i) Spring return single acting cylinder.
- ii) Double acting cylinder with double piston rod
- iii) Check valve
- iv) 2/2 poppet valve
- v) 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)**

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