CBCS SCHEME

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17AU554

Fifth Semester B.E. Degree Examination, July/August 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 a hydraulic power system. With a neat sketch explain the structure of a hydraulic system. List the advantages and applications. **(10 Marks)**

b. State Pascal's law. Explain its application with a neat diagram. **(10 Marks)**

OR

2 a. Mention the classification of pumps used in a hydraulic power system. Explain the working of a balanced vane pump with a neat sketch. **(10 Marks)**

b. Explain with a neat sketch bent-axis type piston motor. **(04 Marks)**

c. A hydraulic motor has a 82 cm^3 volumetric displacement. If it has a pressure rating of 70 bars and it receives oil from a 0.0006 m^3/s theoretical flow rate pump. Determine the motor speed, theoretical torque and power. **(06 Marks)**

Module-2

3 a. Explain with a neat sketch, working of a pressure relief valve. **(06 Marks)**

b. Mention the function and symbolic representation of the following valves:
(i) 4/3 DCV (ii) PRV (iii) Sequence valve
(iv) Pressure compensated flow control valve. **(08 Marks)**

c. Explain with a neat diagram the working of a Poppet valve. **(06 Marks)**

OR

4 a. Explain the desirable properties of hydraulic fluid and explain any four types of hydraulic fluid. **(08 Marks)**

b. Name the four problems of a hydraulic system and mention the four causes for each problem. **(08 Marks)**

c. Explain the different types of Sealing devices. **(04 Marks)**

Module-3

5 a. Explain with a circuit diagram the working of regenerative circuit. **(10 Marks)**

b. Explain single and double acting hydraulic cylinders with diagrams and their graphic symbols. **(10 Marks)**

OR

6 a. Explain with a circuit diagram the working of double pump hydraulic system. Mention its applications. **(10 Marks)**

b. Define accumulator? What are the types of accumulator? Explain with neat sketch any two types of accumulator. **(10 Marks)**

Module-4

7 a. Explain with a neat sketch end cushioning of a pneumatic cylinder. **(08 Marks)**

b. Explain a FRL unit of a Pneumatic Power System. **(06 Marks)**

c. Mention the advantages and disadvantages of a Pneumatic System. **(06 Marks)**

OR

8 a. Explain with a circuit diagram direct and indirect actuation of pneumatic cylinder. **(08 Marks)**
b. Explain supply air throttling and exhaust air throttling of pneumatic cylinder. **(06 Marks)**
c. Explain the working of a quick exhaust valve with a neat sketch. **(06 Marks)**

Module-5

9 a. Explain the sequential motion control of two cylinder with a neat diagram. **(10 Marks)**
b. Explain the OR function of controlling the single acting pneumatic cylinder with a neat circuit. **(10 Marks)**

OR

10 Write a short notes on the following :
a. Air driers
b. Air filters
c. Regulators
d. Lubricators
e. Piping layout **(20 Marks)**

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