

Reg. No.

Question Paper Code

12101

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023

28 JUL 2023

Fourth Semester

Mechanical and Automation Engineering

20MUPC401 - FLUID POWER AUTOMATION

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

- |   | <i>Marks,<br/>K-Level, CO</i> |
|---|-------------------------------|
| 1. Define Pascal law with industrial application.   | 2,K1,CO1                      |
| 2. Draw the ANSI symbols for the following motors;<br>a) Fixed Displacement, unidirectional motor, and<br>b) Variable Displacement, bi-directional motor. | 2,K2,CO1                      |
| 3. Define mechanical and volumetric efficiency of a pump.   | 2,K1,CO2                      |
| 4. Discuss the function of an air filter.   | 2,K2,CO2                      |
| 5. List the functions of a solenoid valve.  | 2,K1,CO3                      |
| 6. Differentiate between pilot operated and direct operated pressure relief valve.  | 2,K2,CO4                      |
| 7. State the use and applications of bleed-off circuit control.   | 2,K1,CO4                      |
| 8. Point out the purpose of a pressure switch.  | 2,K1,CO4                      |
| 9. Mention any two roles of pneumatic systems in low cost automation.   | 2,K1,CO5                      |
| 10. Enumerate digital hydraulics.   | 2,K2,CO6                      |

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) Enumerate the desirable properties and factors considered for the selection of hydraulic fluid. Explain any eight of them in detail. 13,K2,CO1
- OR**
- b) Illustrate various type of power drive used in Fluid power system and differentiate among it. 13,K2,CO1
12. a) Differentiate positive and non-positive displacement pumps. Explain the construction and working of any two positive displacement pumps with suitable examples. 13,K2,CO2
- OR**
- b) Explain any two types of accumulator devices with neat sketch. 13,K2,CO2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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13. a) Explain with neat sketch: 13,K2,CO3  
(i) Unloading valve.  
(ii) Sequence valve.

**OR**

- b) Explain with neat sketch about different types of flow control valve used in the hydraulic systems. 13,K2,CO3

14. a) Explain the counter balance circuit with a suitable application. 13,K2,CO4

**OR**

- b) Design an intensifier circuit for the application of punching press. 13,K2,CO4

15. a) Draw the PLC logic ladder diagram and write the Boolean statements and equations for the logical functions. 13,K2,CO6

**OR**

- b) Explain in detail about digital hydraulics with suitable components. 13,K2,CO6

**PART - C (1 × 15 = 15 Marks)**

16. a) Design a pneumatic circuit for the following sequence using cascade method A+ B+ B- A- C+ C-, where the + cylinder extraction and - cylinder retraction. 15,K3,CO5

**OR**

- b) Design a pneumatic circuit for pick and place robot and explain its working. 15,K3,CO5