Reg. No.																

Question Paper Code	14100

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Fourth Semester

Mechanical and Automation Engineering

20MUPC401 - FLUID POWER AUTOMATION

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Fluid power is also used in _____ systems. (a) Manufactured (b) Produced (c) Automated (d) None of the above	1	K1	CO1
2.	To transmit the power by pressurized _____ from the source unit to the energy consumer point in pneumatic system. (a) Pressure Regulator (b) Air (c) Switch (d) Water	1	K1	CO1
3.	Vane pumps can be used in many different _____ displacement applications. (a) Positive (b) Negative (c) Zero (d) All of the mentioned	1	K1	CO2
4.	_____actuators are used to control and transmit power. (a) Pneumatic (b) Hydraulic (c) Magnetic (d) Electric	1	K1	CO2
5.	A pressure switch is used to: (a) Increase the flow rate (b) Measure temperature (c) Activate or deactivate a circuit based on pressure changes (d) Convert mechanical energy into hydraulic energy	1	K1	CO3
6.	How does a proportional valve control flow compared to a simple directional valve? (a) It allows precise adjustment of flow and pressure (b) It only allows on/off control of the fluid flow (c) It cannot be used in hydraulic systems (d) It completely blocks the fluid in all conditions	1	K1	CO3
7.	Which component is commonly used in pneumatic sequencing circuits? (a) Hydraulic accumulator (b) Pneumatic cylinders and directional control valves (c) Intensifier (d) Pressure compensator	1	K1	CO4
8.	Which circuit removes excess flow without affecting the actuator's speed? (a) Meter-in circuit (b) Meter-out circuit (c) Bleed-off circuit (d) Regenerative circuit	1	K1	CO4
9.	In ladder logic, which component is used to count specific events? (a) Timer (b) Counter (c) Solenoid (d) Relay	1	K1	CO5
10.	Which of the following best describes the role of on/off valves in digital hydraulics? (a) They control motion using discrete signals instead of continuous control (b) They reduce system efficiency compared to proportional valves (c) They are only used in large industrial systems (d) They are less precise than traditional hydraulic valves	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Differentiate between Hydraulics and Pneumatics.	2	K2	CO1
12.	Name the basic components of hydraulic systems.	2	K1	CO1
13.	Define mechanical and volumetric efficiency of a pump.	2	K1	CO2
14.	Point out the purpose of a Pressure regulator.	2	K1	CO2

15.	Represent the symbols for a pressure relief valve and pressure reducing valve.	2	K1	CO3
16.	Discuss the function of pressure control valve.	2	K2	CO3
17.	List any four applications of intensifier.	2	K1	CO4
18.	Define the terms Lap and Null with respect to the servo valves.	2	K1	CO4
19.	State the use of a regenerative circuit.	2	K1	CO5
20.	Differentiate temperature switch and pressure switch.	2	K2	CO5
21.	Give the truth table for fluidic AND/ NAND gate.	2	K1	CO6
22.	Discuss fluidics.	2	K2	CO6

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Illustrate various type of oil used in power hydraulic system and explain it in detail.	11	K2	CO1
		OR			
	b)	With neat sketch explain the hydraulic and pneumatic fluid power systems and mention their applications.	11	K2	CO1
24.	a)	Explain the working principle of unbalanced vane pumps and balanced vane pump with neat sketch.	11	K2	CO2
		OR			
	b)	Explain with a neat sketch; demonstrate the construction and cushioning mechanism in linear actuators. Also state its advantages.	11	K2	CO2
25.	a)	Explain with neat sketch about different types of flow control valve used in the hydraulic systems.	11	K2	CO3
		OR			
	b)	Explain the construction and working of a Quick exhaust valve with a neat sketch.	11	K2	CO3
26.	a)	Develop the construction and working of any two servo control valve with a suitable diagram.	11	K3	CO4
		OR			
	b)	Construct a design of hydraulic circuit for the operation of a hydraulic press and explain.	11	K3	CO4
27.	a)	Design a hydraulic circuit for synchronizing two cylinders with flow control valves.	11	K3	CO5
		OR			
	b)	Design a pneumatic circuit for the following sequence using cascade method A+B+B-A-,where the '+' cylinder extraction and '–'cylinder retraction.	11	K3	CO5
28.	a)	Design an electro hydraulic system for the electrical control of a counter balance circuit and also represent the ladder circuit.	11	K3	CO6
		OR			
	b)	Design an electro-pneumatic system for sorting two different sizes of boxes moving on a conveyor system and also represent the ladder circuit.	11	K3	CO6