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Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Fifth Semester B.Tech Degree (Honours) Examination December 2023 (2021 Admission)



**Course Code: MET 397**

**Course Name: FLUID POWER AUTOMATION**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*(Answer all questions; each question carries 3 marks)*

		Marks
1	List any three fluid power elements with their ISO symbols.	3
2	What are the advantages and disadvantages of axial and radial piston pump?	3
3	What are the different types of mounting used for cylinders?	3
4	What is the function of a hydraulic accumulator? Briefly explain the working of any accumulator with sketch.	3
5	Differentiate between pressure relief and pressure reducing valves.	3
6	What are the deciding factors in quality of the seal in a spool valve?	3
7	What is cascade method? What is the rule associated with it?	3
8	What is latching in ladder diagram? Describe its function with a sketch.	3
9	Describe the steps in PLC operation with a neat flowchart.	3
10	Write a short note on proportional control of hydraulic systems.	3

**PART B**

*(Answer one full question from each module, each question carries 14 marks)*

**Module -1**

- 11 a) Describe briefly about different types of hydraulic motors and the motor selection criteria. 14
- 12 a) Explain with a neat sketch the working and construction of vane pumps. 14

**Module -2**

- 13 a) What is end cushioning in cylinder? Explain how end cushioning is achieved in hydraulic cylinders with neat sketches. 14
- 14 a) Explain any four different types of linear actuators with neat sketches and ISO symbols. 14

**Module -3**

- 15 a) Write short notes on the following with appropriate sketches 6  
i. Check valves  
ii. Shuttle valves  
b) Explain the working of a four-way DC valve with two states, with sketches of 8  
different configurations.
- 16 a) Describe the construction and working of any four types of flow control valves 14  
with neat sketches.

**Module -4**

- 17 a) Design and draw a pneumatic circuit with two cylinders A and B, where first 14  
cylinder A has to extend and then cylinder B has to extend. Then cylinder B has  
to retract, after which cylinder A has to retract. Use cascade method and explain  
the working.
- 18 a) Explain the working of counterbalance valve in a hydraulic circuit with neat 14  
sketch of the circuit.

**Module -5**

- 19 a) Briefly describe the following components in an electro-pneumatic circuit. Show 14  
how they are used in a circuit with the help of an example circuit diagram.  
i. Relays  
ii. Counters  
iii. Timers
- 20 a) Design a sequencing electro-pneumatic circuit for the sequence A+B+A-B- using 14  
a single relay coil and explain the working.

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