Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – SUMMER 2025

Subject Code:2171912 Date:21-05-2025

Subject Name:Oil Hydraulics and Pneumatics

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	State the basic advantages of hydraulic system over mechanical system.	**03**
	(b)	Draw the symbols of pressure reducing valve & pressure relief valve used in hydraulic system.	**04**
	(c)	Explain working and construction of an internal gear pump with neat sketch.	**07**
Q.2	**(a)**	State the Pascal's law. Explain the principle of Bramah's press.	**03**
	(b)	What are the functions of hydraulic fluids? List different types of hydraulic fluids.	**04**
	(c)	Classify hydraulic accumulators. Explain any one with schematic diagram.	**07**
		OR	
	(c)	A double acting hydraulic cylinder is to be operated from two different sources A and B such that its forward motion can be actuated from either of the two locations. Draw and explain a circuit diagram.	**07**
Q.3	**(a)**	Explain broad applications of pneumatic system.	**03**
	(b)	Explain why and where Filters are provided to a hydraulic system.	**04**
	(c)	State and explain four main center conditions of 4/3 spool type direction control valve. Draw hydraulic symbols of each position for 4/3 solenoid operated spring centered direction control valve.	**07**
		OR	
Q.3	**(a)**	Give difference between throttle valve and flow control valve.	**03**
	(b)	State different types of pressure control valves. Explain working of each one with the help of neat sketch.	**04**
	(c)	A pneumatic system is used for punching machining. Design a pneumatic circuit to control a double acting cylinder using 5/2 air-air valve and time delay valve. The piston should extend when two push buttons are pressed simultaneously and automatically retract after fully extended and after specified time delay.	**07**
Q.4	**(a)**	Explain different types of fire resistance hydraulic fluid.	**03**
	(b)	Explain construction and working of Quick Exhaust Valve.	**04**
	(c)	What is FRL unit? Explain any one component of FRL unit with schematic diagram.	**07**
		OR	
Q.4	**(a)**	Explain the following properties of hydraulic fluid. (i) Bulk Modulus (ii) Viscosity (iii) Fire Resistance	**03**
	(b)	Sketch & explain shuttle valve construction & its working.	**04**
	(c)	Sketch the typical fluid reservoir and name the parts, giving their function.	**07**

Q.5	**(a)**	Write applications of hydrostatic transmission.	**03**
	(b)	With neat sketch explain construction and working of push button operated spring return 3/2 DCV.	**04**
	(c)	What is pressure compensated flow control valve? How does pressure compensation take place?	**07**

OR

Q.5	**(a)**	What is a check valve? Show various uses of a check valve in the hydraulic circuit.	**03**
	(b)	What do you mean Automation? Give classification of Automation.	**04**
	(c)	Explain the working principle of hydraulic motor. State the types of hydraulic motors. Also discuss the selection criteria for hydraulic motors.	**07**

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