Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME SEMESTER– II EXAMINATION – SUMMER - 2017

Subject Code: 2724701 **Date:25/05/2017**

Subject Name: Advance Oil Hydraulic and Pneumatic Systems

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.**

Q.1	**(a)**	Compare hydraulic system and pneumatic system with their pros and cons.	**07**
	(b)	Explain the following properties of hydraulic fluid. (i) Viscosity (ii) Lubricity (iii) System Compatibility (iv) Fire Resistance (v) Demulsibility (vi) Flash Point (vii) Specific Gravity	**07**
Q.2	**(a)**	Explain dead weight and spring loaded hydraulic accumulators with schematic diagram.	**07**
	(b)	With neat sketch explain construction and working of quick exhaust valve and shuttle valve.	**07**
		OR	
	(b)	With neat sketch explain construction and working of single stage electro-hydraulic servo valve.	**07**
Q.3	**(a)**	Explain construction and working of pressure relief valve with sketch.	**07**
	(b)	With schematic diagram explain any five major functions of hydraulic reservoir.	**07**
		OR	
Q.3	**(a)**	Explain construction and working of flow control valve with non-return valve with schematic diagram.	**07**
	(b)	With schematic diagram explain construction and working of fixed displacement vane pump.	**07**
Q.4	**(a)**	What are the functions of FRL unit? Explain any one element of FRL unit with neat sketch.	**07**
	(b)	(i) What are the characteristics the Bio-Degradable Oils should have?	**04**
		(ii) With sketch explain overlap in hydraulic valves.	**03**
		OR	
Q.4	**(a)**	Explain any seven applications of pneumatic system.	**07**
	(b)	Give detail classification of hydraulic cylinder according to construction and explain any one with application.	**07**
Q.5	**(a)**	What are the effects of contamination in hydraulic system?	**07**
	(b)	Design a Hydraulic Circuit to control the velocity of piston for forward stroke using lever operated 4/3 direction control valve and flow control valve with non-return valve. Piston should retract with maximum speed.	**07**
		OR	
Q.5	**(a)**	Design and explain regenerative hydraulic circuit.	**07**
	(b)	Design a Pneumatic Circuit to control a double acting cylinder using 5/2 air-air valve. The piston should extend when two push buttons are pressed simultaneously and automatically retract after fully extended.	**07**

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