Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2020

Subject Code:2171912 Date:21/01/2021

Subject Name:Oil Hydraulics & Pneumatics

Time:10:30 AM TO 12:30 PM Total Marks: 56

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Mention the major area of application of hydraulic system.	**03**
	(b)	State the advantages and disadvantages of pneumatic system.	**04**
	(c)	Explain the following properties of hydraulic fluid. (i) Bulk Modulus (ii) Viscosity (iii) System Compatibility (iv) Flash Point (v) Demulsibility (vi) Fire Resistance (vii) Lubricity	**07**
Q.2	**(a)**	Draw the standard symbols of adjustable pressure relief valve, adjustable pressure reducing valve and pressure compensated flow control valve.	**03**
	(b)	Compare positive displacement pump with Roto-dynamic pump.	**04**
	(c)	Explain the construction and working of external gear pump using schematic diagram.	**07**
Q.3	**(a)**	Enlist and explain the functions of hydraulic fluid.	**03**
	(b)	State different types of pressure control valves. Explain working of each one with the help of neat sketch.	**04**
	(c)	Give different types of air compressors. Sketch multistage reciprocating air compressor and enumerate different parts of compressor. What are selection criteria for compressor?	**07**
Q.4	**(a)**	What is the significance of heating and cooling devices in hydraulic system?	**03**
	(b)	Explain construction and working of Quick Exhaust Valve.	**04**
	(c)	Explain cracking pressure and pressure override in context of a pressure relief valve. Draw the pressure override characteristics for an ideal condition of conventional spring loaded PRV.	**07**
Q.5	**(a)**	What is a check valve? Show various uses of a check valve in the hydraulic circuit.	**03**
	(b)	Explain different types of fire resistance hydraulic fluid.	**04**
	(c)	Draw Symbol of filter & explain the working of by-pass type filter.	**07**
Q.6	**(a)**	With neat sketch explain construction and working of push button operated spring return 3/2 DCV.	**03**
	(b)	Draw and explain the regenerative circuit. What are the advantages and disadvantages of it?	**04**

	(c)	What is the significance of FRL unit in pneumatic system? Explain construction and working of lubricator with neat sketch.	**07**
Q.7	**(a)**	Give brief overview on hydrostatic transmission system.	**03**
	(b)	What is the significance of center condition in 4/3 DCV? Which center condition is used in which application, explain each in detail.	**04**
	(c)	Enlist different types of hydraulic cylinders. What is cushioning assembly, explain using schematic diagram.	**07**
Q.8	**(a)**	Classify automation by control system.	**03**
	(b)	Enlist different types of accumulators. Explain dead weight and spring loaded accumulators. Differentiate between them.	**04**
	(c)	Design a pneumatic system to control double acting cylinder using 5/2 Air-Air valve. The piston should extend when two push buttons are pressed simultaneously and it should retract automatically after specified time delay. If the emergency push button is pressed than the piston should retract immediately.	**07**

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