Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII(NEW) EXAMINATION – SUMMER 2019

Subject Code:2171912 Date:14/05/2019

Subject Name:Oil Hydraulics & 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.**

Q.1	**(a)**	State the Pascal's law. Explain the principle of Bramah's press principle.	**03**
	(b)	Draw the circuit of a simple hydraulic system, in standard symbols, and explain briefly the function of its basic elements.	**04**
	(c)	Classify the pumps used for the hydraulic system and explain external and internal gear pump with neat sketches.	**07**
Q.2	**(a)**	Distinguish between Hydraulic system & Pneumatic system.	**03**
	(b)	What is the influence of following properties of hydraulic fluid on hydraulic systems? (i) Bulk Modulus (ii) Demulsibility (iii) Foaming tendency (iv) Volatility	**04**
	(c)	What is the purpose of the filter in a hydraulic system? Where is it located in hydraulic circuit?	**07**
		OR	
	(c)	Write a short note on fire resistant and bio-degradable oils.	**07**
Q.3	**(a)**	State salient functions of oil reservoir. Draw hydraulic symbol of a power pack.	**03**
	(b)	State different types of Accumulator. Explain one in detail.	**04**
	(c)	What is Hydrostatic transmission? Explain the change in torque, power and speed by hydraulic motor with different combination of motor and pump. Give its applications.	**07**
		OR	
Q.3	**(a)**	How does a pressure relief valve differ from a pressure reducing valve?	**03**
	(b)	What is pressure compensated flow control valve? How does pressure compensation take place?	**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**
Q.4	**(a)**	Give difference between Meter-in and Meter-out circuit.	**03**
	(b)	Draw a schematic of a swash plate axial piston pump. Explain briefly its working and construction.	**04**
	(c)	Explain the difference between regenerative and sequence control circuit for hydraulic control with neat sketch and suitable example.	**07**
		OR	
Q.4	**(a)**	What are different sources of heat generation and what is the effect of heat generated in hydraulic system.	**03**
	(b)	Discuss the role of automation in pneumatic and hydraulic control systems.	**04**
	(c)	Explain construction and operation of shuttle valve and twin pressure valve. Illustrate their application through a typical pneumatic circuit.	**07**
Q.5	**(a)**	Write a short note on the Quick Exhaust valve.	**03**

	(b)	Draw the detailed symbol of FRL unit. Explain any two component of the same in detail	**04**
	(c)	Explain construction and operation of time delay valve. Illustrate its application in setting delay in closing time through a typical pneumatic circuit.	**07**

OR

Q.5	**(a)**	Explain 'cushioning' of pneumatic cylinder.	**03**
	(b)	Explain cascade system for circuit design using assumed sequence.	**04**
	(c)	In a press stamping operation to be performed using a stamping machine. Before stamping, work-piece has to be clamped under stamping station. Then stamping tool comes and performs stamping operation. Work-piece must be unclamped only after stamping operation.	**07**

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