Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3151913 Date:22/01/2021

Subject Name:Oil Hydraulics And 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)**	What are limit switches? How do they differ from push button switches?	**03**
	(b)	Which are the different function of hydraulic oil? Also list properties of hydraulic oil.	**04**
	(c)	Give ISO/ANSI symbol of following. i. Single acting cylinder with spring return actuator ii. Bi-directional variable displacement pump iii. Pilot operated pressure relief valve iv. 4/3 directional control valve v. Adjustable flow control valve with throttle vi. FRL unit vii. Telescopic cylinder	**07**
Q.2	**(a)**	Explain any one method of controlling air receiver pressure.	**03**
	(b)	Classify air compressors. Write a short note on selection criteria of compressor.	**04**
	(c)	Cite the classification of check valves and explain the function of pilot-operated check valve, giving the necessary drawing.	**07**
Q.3	**(a)**	Write a short note on fire resistant oil	**03**
	(b)	Explain 4/3 sliding spool direction control valve working.	**04**
	(c)	List different pressure control valves giving its application. Explain construction and working of any one in detail with the help of neat sketch.	**07**
Q.4	**(a)**	Explain ‘cushioning’ of pneumatic cylinder	**03**
	(b)	Write a short note on the Quick Exhaust valve	**04**
	(c)	Explain regenerative circuit with a suitable	**07**

application.

Q.5	**(a)**	Draw a circuit for operation of single acting pneumatic cylinder using push button operated 3/2 DC valve.	**03**
	(b)	How continuous rotary air motors differs from limited rotation air motors?	**04**
	(c)	Explain sequencing of four double acting air cylinders with neat sketch.	**07**
Q.6	**(a)**	In what ways, pneumatic circuits differ from the hydraulic circuits?	**03**
	(b)	Explain cascade system for circuit design using assumed sequence.	**04**
	(c)	Explain with suitable circuits how the single acting and double acting hydraulic cylinders are controlled.	**07**
Q.7	**(a)**	Draw a circuit for operation of unidirectional motor using 3/2 direction control valve	**03**
	(b)	Compare fixed and flexible automation system with suitable example.	**04**
	(c)	Draw and explain sequencing circuit to operate two double acting cylinder using limit valves.	**07**
Q.8	**(a)**	What do you mean by automation? List advantages and disadvantages of automation in fluid power systems.	**03**
	(b)	Give classification of automation in industry. Discuss the role of automation in hydraulic and pneumatic industry	**04**
	(c)	Write short note on programmed automation.	**07**

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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2021

Subject Code:3151913 Date:15/12/2021

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.**

			MARKS
Q.1	**(a)**	Draw the basic hydraulic circuit. Explain the components.	**03**
	(b)	State and explain the advantages and disadvantages of oil hydraulic power transmission system.	**04**
	(c)	Explain various symbols for Hydraulic and Pneumatic as per ISO/ANSI.	**07**
Q.2	**(a)**	What is regeneration in hydraulic system?	**03**
	(b)	Classify the types of hydraulic cylinders. Describe the working of a double acting tandem cylinder.	**04**
	(c)	Draw meter in & meter out circuit giving a suitable example.	**07**
		OR	
	(c)	State functions of hydraulic motor with the help of suitable sketch, explain construction and operation of Gear motor, and difference between vane and gear motor.	
Q.3	**(a)**	What is the function of Pressure Reducing Valve?	**03**
	(b)	What are advantages of fluidics system.	**04**
	(c)	Draw the symbol FRL unit and explain its role in pneumatic system in detail.	**07**
		OR	
Q.3	**(a)**	Explain working of 4/3 sliding spool direction control valve.	**03**
	(b)	Write Short notes on: 1. Ram type actuators 2. Telescopic type actuators.	**04**
	(c)	Explain difference between Hydraulics System and Pneumatics system. Explain main three components of each of them.	**07**
Q.4	**(a)**	Explain non-return valve with suitable sketch.	**03**
	(b)	State and explain the merits and demerits of oil hydraulic power transmission	**04**
	(c)	How speed control is achieved in Pneumatic systems? Explain fixed flow and variable flow control valve with sketch.	**07**
		OR	
Q.4	**(a)**	What is the requirement of control valves?	**03**
	(b)	Show the application of counterbalance valve with the help of suitable circuit diagram.	**04**
	(c)	List the different types of accumulator. Describe working of any two of them.	**07**
Q.5	**(a)**	State function of cushioning mechanism of hydraulic cylinder and state function of valves used in it.	**03**
	(b)	Discuss principle of variable flow control valve.	**04**

	(c)	Why do you prefer the reciprocating pumps over rotary pumps? With the help of a neat sketch, explain the working principle of an Inline piston pump.	**07**

OR

Q.5	**(a)**	How speed control is achieved in Pneumatic systems?	**03**
	(b)	Draw and explain twin lobe compressor.	**04**
	(c)	Sketch & explain Pneumatic Circuit using Quick Exhaust valve and twin pressure valve.	**07**

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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – SUMMER 2021

Subject Code:3151913 Date:07/09/2021

Subject Name:Oil Hydraulics And Pneumatics

Time:10:30 AM TO 01:00 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.**

			MARKS
Q.1	**(a)**	State the Pascal's law and explain Bramah's press principle.	**03**
	(b)	Draw the ISO symbol for following 1. 5/3 DC valve (Open exhaust). 2. 5/3 DC valve (Open pressure) 3. Double acting cylinder 4. Throttle check valve	**04**
	(c)	Compare Hydraulic system with Pneumatic system.	**07**
Q.2	**(a)**	Draw the detailed symbol of FRL unit. Explain any two components of the same in detail.	**03**
	(b)	Classify the compressors used in pneumatics system and explain twin lobe compressor in brief.	**04**
	(c)	With the help of sketch explain different locations of filters.	**07**
		OR	
	(c)	Write a note about different factors to be considered for filter design.	**07**
Q.3	**(a)**	Which are the sources of heat generation in hydraulic system?	**03**
	(b)	Explain working of sequence valve with neat sketch.	**04**
	(c)	Classify the pumps used for the hydraulic system and explain external and internal gear pump with neat sketches.	**07**
		OR	
Q.3	**(a)**	List the special cylinder used in hydraulic system.	**03**
	(b)	Write a short note on the Twin pressure and Quick Exhaust valve.	**04**
	(c)	Classify the pumps used for the hydraulic system and explain working of pressure compensated vane pump with neat sketch.	**07**
Q.4	**(a)**	List the different actuating mechanism used to operate the valve.	**03**
	(b)	What is the flow equalizer and when it is used?	**04**
	(c)	Explain regenerative circuit with neat sketch.	**07**
		OR	
Q.4	**(a)**	Describe the cushioning in brief.	**03**
	(b)	Give difference between Meter-in and Meter-out circuit.	**04**
	(c)	Explain time delay circuit used in pneumatic system.	**07**
Q.5	**(a)**	Explain Flash Point, HWCF and TAN with reference to hydraulic oil.	**03**
	(b)	Which are the different control members in control chain?	**04**
	(c)	Explain the construction of single acting cylinder with neat sketch.	**07**

OR

Q.5	**(a)**	Explain Mesh number, Micron Rating and Slit index with reference to filter.	**03**
	(b)	Which are the different logics can be used in pneumatic circuit design?	**04**
	(c)	Compare Air motor with electric motor.	**07**

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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V(NEW) EXAMINATION – SUMMER 2022

Subject Code:3151913 Date:02/06/2022

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.**

			MARKS
Q.1	**(a)**	State the merits of hydraulic system.	**03**
	(b)	Explain Brahmas press with help of sketch.	**04**
	(c)	Differentiate hydraulic, electric, pneumatic systems.	**07**
Q.2	**(a)**	Draw ISO/ANI symbol of single acting cylinder, FRL, 4/2 DCV	**03**
	(b)	Explain function of filter	**04**
	(c)	Write short note on contaminations.	**07**
		OR	
	(c)	Explain pump cavitation	**07**
Q.3	**(a)**	Give bifurcation of pumps used in hydraulic systems.	**03**
	(b)	Discuss advantages of wobble pump.	**04**
	(c)	Short note: Screw type hydraulic pump.	**07**
		OR	
Q.3	**(a)**	List out accessories of reservoirs.	**03**
	(b)	Discuss functions of heating and cooling devices.	**04**
	(c)	Short note : Spool type DCV	**07**
Q.4	**(a)**	Explain basic steps for circuit design	**03**
	(b)	Draw basic circuit for operating single acting hydraulic cylinder	**04**
	(c)	Explain and develop double pump hydraulic circuit	**07**
		OR	
Q.4	**(a)**	Write advantages of automation	**03**
	(b)	Draw basic circuit for operating double acting pneumatic cylinder	**04**
	(c)	Explain and develop pneumatic circuit for OR logic	**07**
Q.5	**(a)**	List components used in single acting pneumatic cylinder.	**03**
	(b)	Sketch actuation of rotary actuator	**04**
	(c)	Draw neat sketch of hydraulic reservoir. State and explain its functions in detail.	**07**
		OR	
Q.5	**(a)**	Explain time delay valve.	**03**
	(b)	Explain meter in circuit.	**04**
	(c)	Develop Hydraulic circuit for AND logic.	**07**

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