

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.	07
	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	
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

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

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|------------|-----|--|-----------|
| 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**

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

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|------------|--|-----------|
| Q.1 | (a) State the Pascal's law and explain Bramah's press principle. | 03 |
| | (b) Draw the ISO symbol for following | 04 |
| | 1. 5/3 DC valve (Open exhaust). | |
| | 2. 5/3 DC valve (Open pressure) | |
| | 3. Double acting cylinder | |
| | 4. Throttle check valve | |
| | (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**

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 Brahma's 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
