Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2022**

**Subject Code:2171912 Date:05-01-2023**

**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)** | Describe following properties of hydraulic fluid.<br>(i) Demulsibility (ii) Bulk Modulus (iii) Viscosity | **03** |
| | **(b)** | Define Control Valve. List the different types of control valves. | **04** |
| | **(c)** | Compare hydraulic system with mechanical, electrical and pneumatic system. | **07** |
| **Q.2** | **(a)** | Describe briefly about Biodegradable oils. | **03** |
| | **(b)** | Draw general layout of pneumatic system & write function of each components. | **04** |
| | **(c)** | List different types of accumulators and describe functioning of any two with the help of neat sketch. | **07** |
| | | **OR** | |
| | **(c)** | With the help of neat sketch explain the main features of hydraulic reservoir. | **07** |
| **Q.3** | **(a)** | How does an external gear pump differ from an internal gear pump? | **03** |
| | **(b)** | What is the main difference between sequence valve, pressure reducing valve and pressure relief valve? Draw hydraulic symbols of each with proper designations. | **04** |
| | **(c)** | Draw the detailed symbol of FRL unit. Explain any two components of the same in detail. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Compare air motor with electric motor. | **03** |
| | **(b)** | Differentiate between a seat type and spool type DC valve. Which of these two types of valves are widely used? Why? | **04** |
| | **(c)** | What is the significance of center condition in 4/3 DCV? Which center condition is used in which application, explain each in detail. | **07** |
| **Q.4** | **(a)** | Explain ‘cushioning’ of pneumatic cylinder. | **03** |
| | **(b)** | Give over view of fire resistant fluids. | **04** |
| | **(c)** | What is the purpose of filter in hydraulic system? Where it is located in hydraulic circuit? What is the significance of location of filter? | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Why two stage electro-hydraulic valve is preferred over single stage valve? State the function of pilot stage in it. | **03** |
| | **(b)** | With neat sketch explain working and construction of balanced vane pump. | **04** |
| | **(c)** | A single acting cylinder is to be operated from two different sources A and B such that its forward motion can be actuated from either of the two locations. Draw and explain a circuit diagram. | **07** |

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| **Q.5** | **(a)** | Give difference between Meter-in and Meter-out circuit. | **03** |
| | **(b)** | Design and explain regenerative hydraulic circuit. | **04** |
| | **(c)** | Explain construction and working of swash plate axial piston pump with the help of neat schematic diagram. | **07** |

**OR**

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|---|---|---|---|
| **Q.5** | **(a)** | Give brief overview on hydrostatic transmission system. | **03** |
| | **(b)** | Classify automation by control system. | **04** |
| | **(c)** | Explain construction and operation of time delay valve. Explain significance of different components present in a Time delay valve. | **07** |

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