

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– VI (New) EXAMINATION – WINTER 2019****Subject Code: 2162004****Date: 06/12/2019****Subject Name: Hydraulic & Pneumatic Systems****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.

MARKS

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|------------|-----|--|-----------|
| Q.1 | (a) | Write pros and cons of pneumatic system over hydraulic system. | 03 |
| | (b) | Explain major parts which are essentially needed to design and construct a hydraulic system. | 04 |
| | (c) | Compare hydraulic system with mechanical, electrical and pneumatic system. | 07 |
| Q.2 | (a) | Explain different locations of filter in hydraulic circuit. | 03 |
| | (b) | With neat sketch explain construction and working of push button operated spring return 3/2 DCV. | 04 |
| | (c) | Explain construction and operation of time delay valve. Explain significance of different components present in a Time delay valve. | 07 |
| | | OR | |
| | (c) | Explain construction and working of pressure relief valve with schematic diagram. | 07 |
| Q.3 | (a) | What is the significance of heating and cooling devices in hydraulic system? | 03 |
| | (b) | Enlist different types of accumulators. Explain dead weight and spring loaded accumulators. | 04 |
| | (c) | With neat sketch explain working and construction of gear pump. What is trapped oil in terms of internal gear pump? | 07 |
| | | OR | |
| Q.3 | (a) | Explain any four major functions of hydraulic reservoir. | 03 |
| | (b) | Write a short notes on fire resistant and bio-degradable oils. | 04 |
| | (c) | Draw the hydraulic circuit for a vertical cylinder in such a way that the cylinder while extending or retracting does not fall when the power cuts. Show equations of power loss during retraction of the vertical cylinder. | 07 |
| Q.4 | (a) | Give the detail classification of Actuators. | 03 |
| | (b) | Draw and explain Meter-in and Meter out circuit. | 04 |
| | (c) | What is the significance of cushioning system? Explain cushion assembly in detail. | 07 |
| | | OR | |
| Q.4 | (a) | What is Hydrostatic transmission? Give its applications. | 03 |
| | (b) | Draw and explain the regenerative circuit. What are the advantages and disadvantages of it? | 04 |
| | (c) | What is FRL unit? Explain any two component of FRL unit with schematic diagram. | 07 |
| Q.5 | (a) | What is the purpose of center condition in 4/3 DCV? Explain any two center condition in detail. | 03 |

- (b) Explain construction and operation of shuttle valve, twin pressure valve **04**
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- (c) Prepare the pneumatic system to perform automatic to and fro motion of double acting pneumatic cylinder and explain working of it. **07**

OR

- Q.5** (a) Draw the standard symbols of Counter balance valve, pilot operated check valve and Unloading valve. **03**
- (b) Explain construction and operation of quick exhaust valve. Also draw its pneumatic symbols. **04**
- (c) Explain construction and working of proportional valve using schematic diagram. **07**

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