

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2018****Subject Code:2162004****Date:20/11/2018****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.

a**MARKS**

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|------------|--|-----------|
| Q.1 | (a) Mention the major area of application of hydraulic system | 03 |
| | (b) Explain major parts which are essentially needed to design and construct a hydraulic system. | 04 |
| | (c) Explain the following properties of hydraulic fluid.
(i) Bulk Modulus (ii) Specific Gravity (iii) System Compatibility
(iv) Flash Point (v) Demulsibility (vi) Fire Resistance (vii) Lubricity. | 07 |
| Q.2 | (a) Draw the standard symbols of adjustable pressure relief valve, adjustable pressure reducing valve and pressure compensated flow control valve. | 03 |
| | (b) Compare hydraulic system and pneumatic system with their pros and cons. | 04 |
| | (c) Explain the construction and working of external gear pump using schematic diagram. | 07 |
| | OR | |
| | (c) Explain construction and working of proportional valve using schematic diagram. | 07 |
| Q.3 | (a) Explain gas charges accumulator using schematic diagram. | 03 |
| | (b) Explain construction and working of Quick Exhaust Valve. | 04 |
| | (c) With illustrative example explain following phenomenon in context of hydraulic power transmission.
“Pressure and flow rate are independent to each other” | 07 |
| | OR | |
| Q.3 | (a) Explain different locations of filter in hydraulic circuit. | 03 |
| | (b) Draw and explain the regenerative circuit. What are the advantages and disadvantages of it? | 04 |
| | (c) Explain cushion assembly in detail for pneumatic system. What is the requirement of it? | 07 |
| Q.4 | (a) What is the significance of heating and cooling devices in hydraulic system? | 03 |
| | (b) Give detail classification of hydraulic cylinder according to construction. | 04 |
| | (c) Show and explain the power diagram for Meter-in and Meter-out circuits. | 07 |

- Q.4** (a) Explain construction and working of spring loaded check Valve using schematic diagram. **03**
- (b) Write applications of hydrostatic transmission. **04**
- (c) Prepare the pneumatic system to perform automatic to and fro motion of double acting pneumatic cylinder and explain working of it. **07**
- Q.5** (a) Explain functions of FRL unit. **03**
- (b) Explain construction and working of logic Valve used for pneumatic system **04**
- (c) Design and explain regenerative hydraulic circuit. **07**
- OR**
- Q.5** (a) Explain Overlap in hydraulic valves with sketch. **03**
- (b) What is trapped oil in terms of gear pump? Explain with schematic diagram. **04**
- (c) A pneumatic system is used for punching machining. Design a pneumatic circuit to control a double acting cylinder using 5/2 air-air valve and time delay valve. The piston should extend when two push buttons are pressed simultaneously and automatically retract after fully extended and after specified time delay. **07**

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