

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE – SEMESTER – VI EXAMINATION – WINTER 2015**

**Subject Code:162004****Date:14/12/ 2015****Subject Name: Hydraulic & Pneumatic systems****Time:2:30pm to 5:00pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Compare hydraulic system with pneumatic, electrical and mechanical system. **07**  
 (b) Why positive displacement pumps are used in oil hydraulic power transmission system? **07**
- Q.2** (a) What are the functions of hydraulic oil used for power transmission? Which properties are required for fulfilling these functions? **07**  
 (b) 1) Give difference between Meter-in and Meter-out circuit. **03**  
 2) Give difference between Closed center and tandem center 4/3 DC Valve. **04**
- OR**
- (b) What is Hydrostatic transmission? Explain the change in torque, power and speed by hydraulic motor with different combination of motor and pump. Give its applications. **07**
- Q.3** (a) Explain construction and working of swash plate axial piston pump with the help of neat schematic diagram. **07**  
 (b) Draw regenerative circuit. Explain pressure compensated flow control valve. **07**
- OR**
- Q.3** (a) 1) In hydraulic system cylinder extends with velocity of 0.4 m/s with load of 5 kN. The piston diameter is 10 cm and piston rod diameter is 5 cm. If the pump capacity is 4 lps and relief valve is set at 30 bar, find overall efficiency of system. **03**  
 2) In a hydraulic system pump displacement is 50 cc/rev, speed 1500 rpm, pressure 200 bar, and overall efficiency of pump 90%. Determine (1) pump discharge (lpm), (2) pump input power (kW). **04**  
 (b) State different types of accumulators. Explain each in detail. **07**
- Q.4** (a) Explain the significance of position-step and travel-time diagram. **07**  
 (b) Explain construction and operation of time delay valve. Explain significance of different components present in a Time delay valve. **07**
- OR**
- Q.4** (a) Explain construction and operation of shuttle valve, twin pressure valve and quick exhaust valve. Also draw their pneumatic symbols. **07**  
 (b) Draw the detailed symbol of FRL unit. Explain any two component of the same in detail. **07**
- Q.5** (a) Enlist different pressure control valve giving its application. Explain any two in detail. **07**  
 (b) What is the significance of cushioning system? Explain cushion assembly in detail. **07**

**OR**

- Q.5** (a) Explain construction and working of Check valve and Pilot operated check valve with the help of neat schematic diagram. **07**
- (b) With the help of schematic diagram bring out the main features of hydraulic reservoir. **07**

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