

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII EXAMINATION – SUMMER 2016****Subject Code:180204****Date:16/05/2016****Subject Name:Automotive Hydraulics & Pneumatics (Department Elective-II)****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.

- Q.1** (a) State the application of Hydraulic System. Compare Hydraulic system with Pneumatic and Mechanical System. **07**
- (b) Write short note on Hydraulic Fluid Properties. **07**
- Q.2** (a) Draw Following Hydraulic/Pneumatic symbols: **07**
1. Non Return Valve
 2. Counter Balance Valve
 3. Solenoid operated 5/2 Directional Control Valve with Spring return
 4. Twin Pressure Valve
 5. FRL Unit
 6. Cushioned Hydraulic Cylinder
 7. Variable Speed Air Motor
- (b) Explain different center position of the Direction Control Valve with line diagram. Compare open center with closed center valve, critically. **07**
- OR**
- (b) State the purpose of Direction Control Valve. Draw labeled sketch of Rotary spool valve and describe its working. **07**
- Q.3** (a) Explain various Hydraulic Actuators and write selection criteria for it. **07**
- (b) Explain 2-stage Electro-Hydraulic Servo System with diagram. **07**
- OR**
- Q.3** (a) Describe Sequence Valve with neat sketch. Draw Hydraulic application circuit using sequence valve. **07**
- (b) An actuator forward speed is controlled by a meter-in circuit. The pressure setting of relief valve is 50 bar and the pump discharge = 30 litre/min. The cylinder has to carry a load of 3600 N during the forward motion. The area of piston is 15 cm² and rod area = 8cm². The flow control valve is set to allow only 10 litre/ min. Calculate the power input to motor, forward speed and return speed and efficiency of the circuit. **07**
- Q.4** (a) Draw layout of Air Brake and label all its components. Explain its working. **07**
- (b) Explain and draw hydraulic circuit used for the quick return mechanism of a shaper. **07**
- OR**
- Q.4** (a) Draw symbol of Time Delay Valve and explain the same with proper pneumatic circuit. **07**
- (b) Draw hydraulic circuit diagram for tipping mechanism. **07**

- Q.5 (a)** Explain hydraulic steering system using neat sketch. **07**
- (b)** Write short note on Pneumatic suspension system with neat line diagram. **07**

OR

- Q.5 (a)** Explain following Fluidic Logical Pneumatic Gates with suitable application: **07**
1. NAND Gate
 2. NOR Gate
 3. OR Gate
- (b)** Write a short note on maintenance of Air Cylinder and FRL unit. **07**
