Seat No.: _____ Enrolment No._____

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 cm^2 and rod area = 8cm^2. 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: 1. NAND Gate 2. NOR Gate 3. OR Gate	**07**
	(b)	Write a short note on maintenance of Air Cylinder and FRL unit.	**07**

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