Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (OLD) - EXAMINATION – SUMMER 2017

Subject Code:180204 **Date:04/05/2017**

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.**

Figures to the right indicate full marks

Q.1	**(a)**	Draw and explain in brief different elements of hydraulic systems.	**07**
	(b)	Draw symbols for following hydraulic elements. a) Single acting cylinder with spring return b) Non Return flow control Valve c) Sequence Valve d) Check Valve e) 3/2 Direction Control Valve f) Uni-Directional Motor g) Shuttle Valve	**07**
Q.2	**(a)**	Explain with neat sketch Regenerative Hydraulic Circuit.	**07**
	(b)	a) Through a hydraulic pipe of 15 mm diameter oil flows at a rate of 12 litres/minute. Find out the flow velocity.	**04**
		b) Calculate the hydrostatic pressure at the bottom of a hydraulic oil container filled with oil (density = 800 kg/m^3) up to height of 600 mm.	**03**
		OR	
	(b)	a) An 8 L sample of oil is compressed in a cylinder until pressure increases from 0.7 to 2.7 MPa. If the bulk modulus equals 80 MPa, find the change in the volume of oil.	**04**
		b) Define the terms: Specific Density, Specific Weight and Specific Gravity.	**03**
Q.3	**(a)**	Explain with a neat sketch the working of gear pump and its applications.	**07**
	(b)	Draw and explain constructional features of a 5/3-direction control valve of linear type along with its graphical symbol.	**07**
		OR	
Q.3	**(a)**	Explain properties of hydraulic oil in detail.	**07**
	(b)	Draw meter in and meter out circuit with symbols.	**07**
Q.4	**(a)**	Differentiate between open and closed loop hydraulic circuits.	**07**
	(b)	Write short note on Hydraulic power steering with neat sketch.	**07**
		OR	
Q.4	**(a)**	What is servo valve? How does it work? Describe mechanical – hydraulic servo valve.	**07**
	(b)	Draw a hydraulic circuit diagram of a hydraulic system having a double acting cylinder which has a rapid approach speed, then a slow feed motion and at the end of the stroke the cylinder returns rapidly.	**07**
Q.5	**(a)**	Describe with neat sketch Quick Exhaust Valve with application.	**07**
	(b)	List common causes of pneumatic system breakdown and suggest remedies.	**07**

OR

Q.5 **(a)** Explain following Logic Gates used in Pneumatic Circuit with proper application. **07**

a) NOT Gate
b) OR Gate
c) AND Gate

(b) How can you classify the pneumatic actuators? How do hydraulic actuators differ from pneumatic actuators? **07**

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