Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER IV (OLD) – • EXAMINATION – SUMMER 2016

Subject Code: 740901 **Date:04/05/2016**

Subject Name: FLUID DRIVES & CONTROL

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)**	Why do you prefer the reciprocating pumps over rotary pumps? With the help of a neat sketch, explain the working principle of an Inline piston pump. Explain the features of its construction in the light of working principle.	**07**
	(b)	Explain significance of selection of pressure intensity in design of hydraulic power transmission system. Differentiate in terms of construction and application the External gear pump and Unbalanced vane pump.	**07**
Q.2	**(a)**	Explain main advantage of hydraulic system over mechanical system of power transmission. Also state areas of application of hydraulic system. Justify showing the relationship between force, pressure, flow and speed.	**07**
	(b)	What are the functions of hydraulic oil used for power transmission? Discuss which properties are required for fulfilling the functions.	**07**
		OR	
	(b)	"A pneumatic power transmission is preferred as a central power supply for a large factory/plant." Justify these statement. Also, describe each component of central power source?	**07**
Q.3	**(a)**	A mechanical shaper is to be converted to a hydraulic shaper. Develop a circuit diagram for the hydraulic shaper. Note that, existing facilities with mechanical transmission can be used. What are the force and motion requirements of a shaper? How they can be fulfilled using mechanical hydraulic power transmission? Justify your answer.	**07**
	(b)	Give main classification of pressure control valve. Give its constructional details, working and application.	**07**
		OR	
Q.3	**(a)**	Write Short notes on: 1. Ram type actuators 2. Telescopic type actuators.	**07**
	(b)	What is servo motor system? State its one practical application. Explain function of its components and compare servo valve with direction control valve.	**07**
Q.4	**(a)**	State functions of hydraulic motor and define its volumetric efficiency. With the help of suitable sketch, explain construction and operation of Gear motor.	**07**
	(b)	Explain necessity of pressure compensation in Flow control valve. Show the application of flow control valve with the help of Meter-in circuit and give its power diagram.	**07**
		OR	

Q.4 **(a)** A machine vise is to be powered by oil. It involves following operations. **07**

1. The vise jaws are moving in the clamp position.
2. Holding pressure is built-up and applied, when the vise jaws are in clamped position.
3. The holding pressure is relieved.
4. The jaws are moved to the original position.

Suggest a suitable arrangement of hydraulic components represented in the form of a complete circuit using ANSI/ISO symbols. Justify your selection.

(b) Draw a schematic of reservoir and explain its main features. Explain the function of air breather in it. **07**

Q.5 **(a)** Explain 2 way and 3 way DCV for filling and emptying process. **07**

(b) With the help of a suitable circuit diagram explain one practical application of the pneumatic sequence system. Also explain role of roller operated DCV used in the system. **07**

OR

Q.5 **(a)** Explain construction and operation of time delay valve with the help of sketch. How is the delay time adjusted in it? State one practical application of this valve. **07**

(b) A pneumatic system has two cylinders operating in sequence. Explain functions of main components of the system and state at least one application of the system. **07**

****