Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. – SEMESTER – IV EXAMINATION – OCTOBER 2012

Subject code: 740901 **Date: 25-10-2012**

Subject Name: Fluid Drives and Control

Time: 2:30 pm – 5:00 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)**	Explain main advantage of hydraulic system over mechanical system of power transmission. Also state areas of application of hydraulic system.	**07**
	(b)	(i) Compare positive displacement pump with rotodynamic pump in terms of their characteristics. State different types of positive displacement pump. (ii) Explain function of receiver and pressure limit switch of air compressor.	**04** **03**
Q.2	**(a)**	Explain main function of working medium of hydraulic system and in that context, check suitability of petroleum oil as working medium. Explain significance of specific heat of working medium also.	**07**
	(b)	Why is the pressure relief valve provided with positive displacement pump? With the help of neat sketch, explain working principle of Balanced vane pump and explain its main features.	**07**
		OR	
	(b)	Explain significance of selection of pressure intensity in design of hydraulic power transmission system. Compare External gear pump with Unbalanced vane pump in terms of construction and application.	**07**
Q.3	**(a)**	(i) Give complete classification of hydraulic cylinders and state application of Ram type hydraulic cylinder. (ii) State function of cushioning mechanism of hydraulic cylinder and state function of valves used in it.	**04** **03**
	(b)	Show the application of counterbalance valve with the help of suitable circuit diagram. Describe working of the system and explain how and when the counterbalance valve will operate.	**07**
		OR	
Q.3	**(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)	Differentiate clearly between normally open and normally closed type pressure control valve. Explain function of Pressure reducing valve, give its symbol and state its application.	**07**
Q.4	**(a)**	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**
	(b)	What is servo motor system? State its one practical application.	**07**

Explain function of its components and compare servo valve with direction control valve.

OR

Q.4	**(a)**	Explain effects of solid particles present in oil on hydraulic system. Give significance of filtration and explain its economics.	**07**
Q.4	**(b)**	Explain difference between a simple solenoid valve and a proportional valve. Explain working of a proportional valve with the help of sketch.	**07**
Q.5	**(a)**	(i) State function of baffle plate and air breather provided in reservoirs.	**03**
		(ii) Compare pneumatic system with hydraulic system, cost point of view and explain the treatment given to atmospheric air before using it in pneumatic system.	**04**
	(b)	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**

OR

Q.5	**(a)**	(i)Why is the hydraulic accumulator known as secondary power source? Compare gas charged accumulator with weight loaded accumulator.	**04**
		(ii) Explain function and construction of Twin pressure valve.	**03**
	(b)	Explain application of Quick exhaust valve with the help of suitable circuit diagram and describe working of the system.	**07**

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