Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – SUMMER 2013

Subject Code: 161905 Date: 30-05-2013

Subject Name: Control Engineering

Time: 10.30 am - 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)**	Explain the following: (i) Open loop control system (ii) Closed loop control system (iii) Servomechanism	**07**
	(b)	(i) Define transfer function and explain its significance in control engineering. (ii) List and explain the different applications of control engineering in various in fields.	**07**
Q.2	**(a)**	Draw a neat sketch of microprocessor based digital control system and explain the functions of each element. State its advantages also.	**07**
	(b)	Write short note on : control systems for thermal power plant	**07**
		OR	
	(b)	Explain the concepts of fuzzy logic and fuzzy control systems.	**07**
Q.3	**(a)**	Compare hydraulic control system with pneumatic control system in detail. State the different applications of pneumatic control system.	**07**
	(b)	State the different types of hydraulic pumps and explain the factors affecting selection it. Explain the construction and working of vane pump with neat sketch.	**07**
		OR	
Q.3	**(a)**	Represent a generalised hydraulic control system by a block diagram and explain the functions of each element.	**07**
	(b)	Explain the construction and working of 4 ï land rotary spool valve with neat sketches.	**07**
Q.4	**(a)**	What do you mean by stability of a control system? Explain Routhôs stability criterion.	**07**
	(b)	Explain Masonôs rule as used for determining the overall transfer function from a signal flow diagram.	**07**
		OR	
Q.4	**(a)**	What does a block diagram represent? Explain it in detail. List its salient characteristics. Explain the following: Summing point, takeoff point.	**07**
	(b)	List the basic types of control actions and explain the PDI control action in detail.	**07**
Q.5	**(a)**	What do you mean by mathematical modeling of a control system? Explain its importance.	**07**
	(b)	Explain and derive the transfer function for an armature controlled d.c. motor.	**07**
		OR	
Q.5	**(a)**	Write short note on: Analogue models of mechanical and electrical system.	**07**
	(b)	Explain the transient response of second order system.	**07**

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