Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022

Subject Code:3160104 Date:03/06/2022

Subject Name:Basic control theory

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Explain the difference between open and closed loop control system	**03**
	(b)	Guided missile control is an example of the closed loop control system. Justify the statement.	**04**
	(c)	Explain the steps for block diagram reduction method	**07**
Q.2	**(a)**	Explain the mason's gain formulae	**03**
	(b)	Explain the SFG with one example in detail	**04**
	(c)	Explain Time domain specification in detail	**07**
		OR	
	(c)	Explain the steps for plotting the root locus	**07**
Q.3	**(a)**	Explain Routh's criteria.	**03**
	(b)	Derive the transfer function for RLC series circuit	**04**
	(c)	Explain steady state error for Type-0, 1 and 2 system.	**07**
		OR	
Q.3	**(a)**	Explain various types of standard test input signals	**03**
	(b)	Explain the difference between the modern control system and conventional control system	**04**
	(c)	Explain steps for designing the Bode plot	**07**
Q.4	**(a)**	Explain difference between natural and manmade control system	**03**
	(b)	Explain spring, mass and damper system in detail	**04**
	(c)	Derive the steps for designing the Nyquist plot	**07**
		OR	
Q.4	**(a)**	Explain ON-OFF controller with dead zone	**03**
	(b)	Explain the function of proportional controller	**04**
	(c)	Explain PID controller	**07**
Q.5	**(a)**	Explain Nyquist stability criteria	**03**
	(b)	Explain linear time invariant systems	**04**
	(c)	Explain desired features of feedback control algorithms	**07**
		OR	
Q.5	**(a)**	Explain Hurwitz criteria	**03**
	(b)	Explain the difference between SISO and MIMO system	**04**
	(c)	Explain the state space representation in detail and its importance in control theory	**07**

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