Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER- VII EXAMINATION-SUMMER 2023

Subject Code: 3170108 Date: 22/06/2023

Subject Name: Aircraft Control and Navigation

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.**

Q.1	**(a)**	What is the role of Dead Reckoning in air navigation?	**03**
	(b)	Differentiate between lateral and longitudinal autopilot.	**04**
	(c)	Briefly explain Transient response of Aircraft. How does affect aircraft control.	**07**
Q.2	**(a)**	Shortly explain importance of Flight Management System.	**03**
	(b)	Define Cross coupling. Explain how its affect the stability of Aircraft while rolling.	**04**
	(c)	Explain relation between Automatic fuel control system and throttle setting.	**07**
		OR	
	(c)	Explain Height and Throttle control system with block diagram.	**07**
Q.3	**(a)**	Explain gyro system for controlling cross coupling condition of Aircraft.	**03**
	(b)	Define Turn Compensation. Derive equation of Turn Compensation.	**04**
	(c)	What is Air Navigation? Explain any one type of Air Navigation method.	**07**
		OR	
Q.3	**(a)**	Enlist the remedies to control Dutch roll effect.	**03**
	(b)	Explain role of Glide Slope coupler in conventional ILS landing..	**04**
	(c)	Explain Integration of flight management system with Autopilot in brief.	**07**

Q.4	**(a)**	Explain why ILS is coupled with autopilot.	**03**
	(b)	Define Dutch Roll. Explain principle of damping of dutch roll.	**04**
	(c)	Briefly explain any one type of aircraft control system.	**07**

OR

Q.4	**(a)**	Explain Displacement Autopilot with Suitable block diagram.	**03**
	(b)	Explain Acceleration control system of a jet transport aircraft.	**04**
	(c)	Explain Basic Autopilot system in brief.	**07**
Q.5	**(a)**	Derive equation of linear motion of an Aircraft.	**03**
	(b)	What is Yaw Orientation Control system? What is yawing?	**04**
	(c)	Explain GPS air navigation system.	**07**

OR

Q.5	**(a)**	Explain how High roll rates affects the stability of an Aircraft.	**03**
	(b)	Which assumptions will you take while deriving equation of motion?	**04**
	(c)	Derive Equation of angular motion for fix wing Aircraft.	**07**

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