Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2024

Subject Code:3170108 Date:17-05-2024

Subject Name:Aircraft Control and Navigation

Time:02:30 PM TO 05:00 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)**	Define (i) Stability (ii) Navigation (iii) Dutch Roll	**03**
	(b)	Derive equation for Turn Compensation with suitable sketch.	**04**
	(c)	Explain Pitch Orientation control system with Functional diagram.	**07**
Q.2	**(a)**	List out the parameters which are affecting stability of an aircraft.	**03**
	(b)	Explain GPS based navigation.	**04**
	(c)	Explain Yaw Orientation control system with Block diagram.	**07**
		OR	
	(c)	Explain ILS/MLS coupled autopilot system in brief.	**07**
Q.3	**(a)**	Write a note on glide slop coupler.	**03**
	(b)	Explain lateral autopilot with block diagram.	**04**
	(c)	Find out aircraft's attitude with respect to earth by euler's angle method.	**07**
		OR	
Q.3	**(a)**	Explain GPS based navigation.	**03**
	(b)	Write a short note on Deck reckoning.	**04**
	(c)	Explain Flight Management system in brief	**07**
Q.4	**(a)**	Why control and Navigation systems are necessary for aircraft.	**03**
	(b)	Explain Principle and application of Autopilot System in brief.	**04**
	(c)	Derive an equation of linear motion for control locked position aircraft.	**07**
		OR	
Q.4	**(a)**	Explain positioning in terms of navigation.	**03**
	(b)	Explain transient response of an aircraft.	**04**
	(c)	Explain inertial cross coupling in brief.	**07**
Q.5	**(a)**	Write a short note on surveillance	**03**
	(b)	What is dutch roll? How would you design dutch roll block diagram?	**04**
	(c)	Explain the system for controlling an aircraft subject to Inertial cross coupling	**07**
		OR	
Q.5	**(a)**	What is short period mode?	**03**
	(b)	What is long period mode?	**04**
	(c)	Explain Acceleration control system with suitable block diagram.	**07**

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