

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII EXAMINATION – WINTER 2025

Subject Code:3170108

Date:15-11-2025

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.

	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 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) Explain aircraft's attitude with respect to earth by euler's angle method.	07
OR	
Q.3 (a) Explain autopilot system.	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) 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
