Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3170101 Date:04-12-2024

Subject Name: Aircraft Design

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)**	Give brief classification of fixed wing aircrafts.	**03**
	(b)	Differentiate between cruise & Maximum Speed.	**04**
	(c)	How will you determine the Fuel Fraction for conceptual design?	**07**
Q.2	**(a)**	What is the effect of Wing loading on takeoff?	**03**
	(b)	Discuss the Biplane Wings with neat sketch.	**04**
	(c)	What is Geometric Aerodynamic Centre? What is role of GAC to find tail sizing?	**07**
		OR	
	(c)	What are the Aerodynamic considerations of fuselage? Explain.	**07**
Q.3	**(a)**	Define Centre of Pressure, Neutral point, Centre of Gravity.	**03**
	(b)	Differentiate between layout and lofting.	**04**
	(c)	Discuss in detail the difference between Rubber Engine Sizing and Fix Engine Sizing.	**07**
		OR	
Q.3	**(a)**	What do you understand by Maximum Take Off Weight?	**03**
	(b)	How to carry out Airfoil selection for Tail arrangement?	**04**
	(c)	What are the locations for tail placement on different types of aircrafts? Discuss	**07**
Q.4	**(a)**	Differentiate between Expandable and Non Expandable Payloads.	**03**
	(b)	How is Wetted Area Determination carried out?	**04**
	(c)	Discuss Jet engine integration in aircraft design.	**07**
		OR	
Q.4	**(a)**	Explain advantage of flat wrap fuselage lofting.	**03**
	(b)	Explain Circle-To-Square adapter.	**04**
	(c)	What is crashworthiness? Which considerations will you take with respect to crashworthiness?	**07**
Q.5	**(a)**	How will you determine size of main wheels and nose wheels of a tricycle landing gear?	**03**
	(b)	Discuss Radar detectability as Special Considerations.	**04**
	(c)	Statistical Group weight Method.	**07**
		OR	
Q.5	**(a)**	Draw neat sketch of oleo type suspension mechanism.	**03**
	(b)	Discuss landing gear systems of sea planes.	**04**
	(c)	Explain Approximate Group Weight Method.	**07**

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