

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3170101****Date:12-12-2023****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) Classify stages of aircraft design.	03
	(b) Explain flight envelope with neat sketch.	04
	(c) Explain procedure for Determination of Fuel Fraction with example.	07
Q.2	(a) How will you determine Payload of Aircraft?	03
	(b) How will you determine Thrust/Weight Ratio for any aircraft?	04
	(c) Explain different types of aft-tail configurations with figure	07
	OR	
	(c) Explain method to determine wing loading of aircraft.	07
Q.3	(a) What is structure factor in aircraft design?	03
	(b) Shortly explain Propeller engine integration.	04
	(c) Explain circle – to- square adapter Application in Aircraft Design with figure	07
	OR	
Q.3	(a) Explain Wetted Area Determination	03
	(b) Explain Approximate Group Weight Method	04
	(c) Explain Aerodynamics considerations of fuselage.	07
Q.4	(a) Explain the significance of Aspect ratio	03
	(b) Which type of Airfoil can select in Design of ailerons and rudder?	04
	(c) How will you estimate L/D ratio of aircraft design?	07
	OR	
Q.4	(a) What is the function of winglet?	03
	(b) How will you choose airfoil section of a horizontal stabilizer? Please write valid comment with justification	04
	(c) Discuss Structural considerations during design procedure with appropriate figure.	07
Q.5	(a) What is the function of Lofting?	03
	(b) Explain structural considerations with neat sketches	04
	(c) With neat sketch explain conic lofting technique for fuselage.	07
	OR	
Q.5	(a) Define radar and infrared detectability	03
	(b) Discuss structural considerations of a monocoque fuselage aircrafts.	04
	(c) Discuss gear retraction geometry with neat sketch.	07
