

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- VII EXAMINATION – SUMMER 2026****Subject Code:2170101****Date:01-06-2026****Subject Name: Aircraft Design- I****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) Classify Aircraft categories as per Aircraft Purpose.	03
	(b) Explain the following design terms with example:-	04
	(1) Payload (2) Range	
	(c) Explain Conceptual design of an aircraft with diagram.	07
Q.2	(a) Explain phases of aircraft with example.	03
	(b) How will you determine payload for the aircraft conducting long range flight?	04
	(c) Explain aircraft development process with block diagram	07
	OR	
	(c) Explain Tail placement in tail design of aircraft	07
Q.3	(a) Explain structure factor in aircraft design?	03
	(b) Shortly explain Propulsion selection methods in aircraft design	04
	(c) Explain Aerodynamic consideration in aircraft Fuselage design	07
	OR	
Q.3	(a) Explain Internal structural design with example	03
	(b) Explain static stability of aircraft	04
	(c) Discuss effect of wing loading on flight performance	07
Q.4	(a) Explain the significance of Taper ratio in design.	03
	(b) Explain Refined weight estimate Method	04
	(c) Explain Volume considerations of fuselage.	07
	OR	
Q.4	(a) Explain Airfoil selection in horizontal and vertical stabilizer.	03
	(b) Explain Principle of helicopter operations	04
	(c) Explain different configurations of helicopter with figure.	07
Q.5	(a) Explain Wing loading effect on takeoff.	03
	(b) Explain turbo jet engine sizing	04
	(c) Explain Tail rotor design in Helicopter.	07
	OR	
Q.5	(a) How will you select number of engine in aircraft design?	03
	(b) How will you select airfoils for rotor blades in helicopter?	04
	(c) Explain take-off and landing distance with figure and calculation	07
