Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 170101 **Date: 09/05/2017**

Subject Name: Aircraft Design - 1

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.**

Q.1	**(a)**	Briefly explain three stages of Aircraft design.	**07**
	(b)	What do you understand by conceptual design? What are requirements to prepare conceptual design?	**07**
Q.2	**(a)**	Explain different types of fuel weights.	**07**
	(b)	Explain method to determine wing loading of aircraft.	**07**
		OR	
	(b)	Explain importance of Dihedral, Polyhedral and Anhedral wing configurations.	**07**
Q.3	**(a)**	How will you select fuselage length required for passenger aircraft?	**07**
	(b)	With neat sketch explain advantages and disadvantages of different tail plane configuration.	**07**
		OR	
Q.3	**(a)**	How will you determine Thrust/Weight ratio for any aircraft?	**07**
	(b)	Explain the procedure to design conventional tail.	**07**
Q.4	**(a)**	Differentiate turbofan engine and turbo shaft engine with respect to performance and applications.	**07**
	(b)	Describes techniques to improve stability and maneuverability in different types of fighter aircrafts.	**07**
		OR	
Q.4	**(a)**	With neat sketch explain propulsion system selection technique.	**07**
	(b)	Differentiate between deicing and anti icing. Why bleed air supply is shut off at the time of take off in aircraft.	**07**
Q.5	**(a)**	Define following term: (i) Maximum takeoff weight, (ii) Payload weight, (iii) basic empty weight, (iv) Maximum cruising speed, (v) Stalling speed, (vi) Maneuvering speed and (vii) Maximum zero fuel weight.	**07**
	(b)	Compare between Aircraft rudder operation and Helicopter tail rotor operations with neat sketch.	**07**
		OR	
Q.5	**(a)**	How will you choose airfoil section for your design? Discuss briefly.	**07**
	(b)	Briefly explain Cyclic and Collective pitch operations in helicopters for maneuvering purpose.	**07**

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