Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–7 • EXAMINATION – SUMMER 2015

Subject Code: 170101 **Date: 01/05/2015**

Subject Name: Aircraft Design-I

Time: 02:30 to 05:00 **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 3 phases of aircraft design.	**07**
	(b)	Explain design and development process of aircraft. Explain with block diagram.	**07**
Q.2	**(a)**	Derive an equation to determine Maximum Take-Off Weight (W_O) of Aircraft.	**07**
	(b)	Explain method to determine Wing loading of aircraft.	**07**
		OR	
	(b)	Differentiate between Fix Engine and Rubber Engine Sizing Method.	**07**
Q.3	**(a)**	Explain method to determine T_{MAX}/W_O of aircraft.	**07**
	(b)	What are considerations to choose suitable propulsion system?	**07**
		OR	
Q.3	**(a)**	How will you select wing plan form shape? Which factors affect wing plan form shape?	**07**
	(b)	Explain advantages and disadvantages of retractable landing gear over fix landing gear.	**07**
Q.4	**(a)**	Describe procedure to design medium transport aircraft.	**07**
	(b)	Explain method to prepare tail plane geometry.	**07**
		OR	
Q.4	**(a)**	Classify different types tail plane locations and configurations in transport aircrafts.	**07**
Q.4	**(b)**	Explain why sweep back or delta wing plan form is suitable for high subsonic or supersonic aircrafts.	**07**
Q.5	**(a)**	Describe technics to improve stability and maneuverability in different types of fighter aircrafts.	**07**
	(b)	Explain how wing loading affects take-off performance and maneuverability of aircraft.	**07**
		OR	
Q.5	**(a)**	Explain role of flight envelope on aircraft mission.	**07**
	(b)	Explain how aspect and taper ratio is selected to prepare wing layout.	**07**

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