Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – WINTER 2013

Subject Code: 170101 **Date: 26-11-2013**

Subject Name: Aircraft Design-I

Time: 10.30 AM - 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.**

Q.1	**(a)**	Define-Payload, Maximum Take-Off Weight, Maximum Landing Weight, Trapped fuel, Reserved Fuel, Maximum Ramp Weight, Maximum Zero Fuel Weight.	**07**
	(b)	Explain the procedure to design conventional tail.	**07**
Q.2	**(a)**	Explain method to design geometrical parameters of aircraft fuselage of public transport aircraft.	**07**
	(b)	Explain importance of V, Inverted V, H, T, Cruciform, Conventional Tail and canards.	**07**
		OR	
	(b)	What considerations will you take to design a military transport aircraft?	**07**
Q.3	**(a)**	Discuss effect of wing loading on landing performance.	**07**
	(b)	What considerations will you take to design all primary control surfaces?	**07**
		OR	
Q.3	**(a)**	Explain principles of aerodynamic and mass balancing of primary control surfaces.	**07**
	(b)	Explain factors affecting weight of horizontal and vertical stabilizers.	**07**
Q.4	**(a)**	Explain the procedure to estimate T_{max}/W_o and W_o/S_w .	**07**
	(b)	With vector diagrams and neat sketches explain cyclic and collective pitch control mechanism of main rotor.	**07**
		OR	
Q.4	**(a)**	Discuss required engine location and engine selection for jet aircrafts.	**07**
	(b)	Discuss considerations to locate fuel tanks for fighters and commercial jet airliners.	**07**
Q.5	**(a)**	What are interring relationship among stalling speed, approach speed, take-off speed, cruising speed and Maximum cruising speed?	**07**
	(b)	What are general considerations to design configurations of personal utility aircraft?	**07**
		OR	
Q.5	**(a)**	What are general considerations to design configurations of gliders or sailplanes?	**07**
	(b)	Discuss necessary six parameters to start aircraft conceptual design.	**07**

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