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

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:180101 **Date:02/05/2017**

Subject Name: Aircraft Design - II

Time:10:30 AM to 01:30 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	Draw wing layout of a supersonic jet fighter having wing loading of 78 lbs/ft$^{2.}$ Maximum takeoff weight is 50692 lbs. Wing Aspect Ratio is 2.2. Wing Taper ratio is 0.15. Wing is having laminar airfoil on root having 6% thick and 4% on tip with 0˚ wing twist. Control surface covers 10% of chord and 100% span.	07
	B	Mention Geometric Aerodynamic Centre, Centre of Gravity Margin, and Static Margin on above mentioned design.	07
Q-2	A	Take appropriate distance from wing to locate horizontal stabilizer. Aspect ratio is 3. Taper ratio is 0.4. Choose proper sweep back angle.	07
	B	While designing a vertical fin of a supersonic jet fighter which considerations should be taken to minimize wave drag?	07
		OR	
	B	Explain reasons not to choose mid wing or high wing configurations in public transport aircrafts.	07
Q-3	A	Only draw any seven types of undercarriage retraction geometry.	07
	B	Discuss under carriage loads.	07
		OR	
	A	Draw and explain base distance, track distance, turning radius, wheel diameter, tip back angle. Only draw for naval version.	07
	B	Explain how you will reduce manufacturing cost of airframe construction if redesigned for higher payload.	07
Q-4	A	How will you design an aircraft such a way that it can survive after extreme battle damage.	07
	B	Explain radar detectability and mention techniques to improve and to reduce RCS.	07
		OR	
	A	How will you design V-Tail configuration in unpowered sailplane?	07
	B	Explain design methodology of weapon carriages.	07
Q-5	A	How will you design passenger cabin of a jet transport medium range aircraft?	07
	B	Describe method to determine maximum takeoff weight of a unpowered sailplane.	07
		OR	
	A	Draw and explain crew station design of a conventional supersonic jet aircraft.	07
	B	Discuss fuselage loads of a single engine piston prop aircraft.	

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