Enrolment No.

## **GUJARAT TECHNOLOGICAL UNIVERSITY** BE - SEMESTER-VIII • EXAMINATION – SUMMER 2014

Subject Code: 180101 Subject Name: Aircraft Design-II Time: 10.30 am - 01.30 pm Instructions:

Date: 05-06-2014

**Total Marks: 70** 

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- 4. Q-1(a, b) and Q-2 (a) must be attained on Drawing Sheet (Scale: 1cm=4 feet)
- Q.1 (a) Using below mentioned data draw a wing layout of public transport jet aircraft. Max 07 T/O Weight=264240 lbs, Mach no= 0.85, Wing loading= 120 lbs. /ft², fuselage fines ratio=12:1, fuselage length= 144 ft. Wing Aspect Ratio= 7.5, Wing Taper Ratio= 0.25,
  - (b) Mention all required primary and secondary control surfaces in above mentioned 07 design along with Mean Aerodynamic Chord, Geometric Aerodynamic Centre and suitable Centre of Gravity Range.
- Q.2 (a) Draw a layout of tail plane. Aspect ratio of Horizontal stabilizer= 4, Taper Ratio of 07 Horizontal Stabilizer= 0.38, L<sub>HT</sub>= b/2, C<sub>HT</sub>= 1, Elevator Chord = 32% of Stabilizer chord.

	<b>(b)</b>	Give a short note on fuselage loft verification.	07
		OR	
	<b>(b)</b>	Explain how lofting is prepared for fuselage.	07
Q.3	(a)	What aerodynamic considerations to design supersonic aircrafts?	07
	<b>(b)</b>	How will you locate flaps and engines on aircraft wings?	07
		OR	
<b>Q.3</b>	(a)	Explain functions of all primary and secondary control surfaces of aircraft.	07
·	(h)	Give a short note on infrared detectability.	07
	()		07
Q.4	<b>(a)</b>	How will you reduce radar detectability of a fighter plane?	07
	<b>(b)</b>	How will you design passenger compartment of aircraft.	07
	()	OR	
<b>O.4</b>	(a)	Differentiate between Jet VTOL and Prop VTOL aircrafts.	07
·	(h)	What are the considerations to design tail plane.	07
	()		07
Q.5	(a)	Explain conceptual and preliminary design shortly.	07
	(b)	Explain geometric sizing of control surfaces.	07
	()	OR	
0.5	<b>(</b> a)	Give a short note on landing gear loads	07
<b>~</b> ••	(u) (b)	Evolution how a conventional baliconter management around all three axis	07
	(U)	Explain now a conventional hencopter maneuvers around an unlee axis.	07

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