

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

Subject Code: 180101**Date: 05-06-2014****Subject Name: Aircraft Design-II****Time: 10.30 am - 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.
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 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, **07**
- (b)** Mention all required primary and secondary control surfaces in above mentioned design along with Mean Aerodynamic Chord, Geometric Aerodynamic Centre and suitable Centre of Gravity Range. **07**
- Q.2 (a)** Draw a layout of tail plane. Aspect ratio of Horizontal stabilizer= 4, Taper Ratio of Horizontal Stabilizer= 0.38, $L_{HT} = b/2$, $C_{HT} = 1$, Elevator Chord = 32% of Stabilizer chord. **07**
- (b)** Give a short note on fuselage loft verification. **07**
- OR**
- (b)** Explain how lofting is prepared for fuselage. **07**
- Q.3 (a)** What aerodynamic considerations to design supersonic aircrafts? **07**
- (b)** How will you locate flaps and engines on aircraft wings? **07**
- OR**
- Q.3 (a)** Explain functions of all primary and secondary control surfaces of aircraft. **07**
- (b)** Give a short note on infrared detectability. **07**
- Q.4 (a)** How will you reduce radar detectability of a fighter plane? **07**
- (b)** How will you design passenger compartment of aircraft. **07**
- OR**
- Q.4 (a)** Differentiate between Jet VTOL and Prop VTOL aircrafts. **07**
- (b)** What are the considerations to design tail plane. **07**
- Q.5 (a)** Explain conceptual and preliminary design shortly. **07**
- (b)** Explain geometric sizing of control surfaces. **07**
- OR**
- Q.5 (a)** Give a short note on landing gear loads. **07**
- (b)** Explain how a conventional helicopter maneuvers around all three axis. **07**
