

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**
