

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – SUMMER • 2014****Subject Code: 170101****Date: 22-05-2014****Subject Name: Aircraft Design-I****Time: 02:30 pm - 05:00 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 and very shortly explain- Useful Load, Aircraft Conceptual Design, Preliminary Design, Detail Design, **07**
(b) Explain the procedure to design plan form of Horizontal Stabilizer. **07**
- Q.2** (a) In which cases designer decide to design cruciform, T- Tail or Conventional tail ? **07**
(b) How will you determine Thrust/Weight Ratio for any aircraft? **07**
- OR**
- (b) What considerations will you take to design a public transport aircraft? **07**
- Q.3** (a) What are effects of wing loading on take-off and cruise performance. **07**
(b) How will you determine geometry of elevators, rudder and Ailerons? Explain with neat sketch. **07**
- OR**
- Q.3** (a) Explain design features of conventional helicopters. **07**
(b) With neat sketch explain methods to reduce aerodynamic loads and flutter vibrations on primary control surfaces. **07**
- Q.4** (a) Shortly explain two procedures for power plant selection while conceptual designing. **07**
(b) With isometric sketch explain functions or applications of components of conventional helicopters. **07**
- OR**
- Q.4** (a) Discuss required Propeller engine locations. **07**
(b) What types of weights should be estimated in first phase of aircraft design? **07**
- Q.5** (a) Shortly define- Maximum Take-Off Weight, Maximum Cruising Speed, Stalling Speed, Maximum Ramp Weight, Maneuvering Speed, Approach Speed and Maximum Landing Weight. **07**
(b) How will you choose Airfoil section for your design? Discuss briefly. **07**
- OR**
- Q.5** (a) Explain effects of Power loading on take-off and cruise. **07**
(b) How will you decide aspect ratio and sweep back angle of wing? **07**
