

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – WINTER • 2014****Subject Code: 170101****Date: 25-11-2014****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) Explain main three phases of aircraft design. **07**
(b) Very shortly explain how wing loading and Thrust-weight ratio affect flight performance. **07**
- Q.2** (a) How will you choose different plan form shapes to fulfill various purposes? **07**
(b) How will you locate Geometric Aerodynamic Centre, Centre of pressure and Centre of Gravity on plan form shape of wing? **07**
- OR**
- (b) How you determine sizes of Primary control surfaces? **07**
- Q.3** (a) With neat sketch explain function of trim tab. **07**
(b) Explain various tail plane configurations with neat sketches. **07**
- OR**
- Q.3** (a) Explain importance of Dihedral, polyhedral and anhedral wing configurations. **07**
(b) How will you determine area of a stabilators of a jet fighter aircraft? **07**
- Q.4** (a) Explain how you will determine L/D ratio of a design you started. **07**
(b) With neat sketch explain anti and deicing system of a rotary wing aircraft. **07**
- OR**
- Q.4** (a) With neat sketch explain nomenclature of a conventional rotary wing aircraft. **07**
(b) With neat diagrams explain functions of cyclic and collective controls of a conventional helicopter. **07**
- Q.5** (a) How will you determine plane form area and shape of a vertical fin? **07**
(b) With neat sketch explain propulsion system selection technic. **07**
- OR**
- Q.5** (a) Define Fuel weight, Basic empty weight, Payload weight, Maximum Takeoff weight, Maximum zero fuel weight, Maximum ramp weight, **07**
(b) Which considerations will you choose to design fuselage of twin turboprop aircrafts? **07**
