

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-IV • EXAMINATION – SUMMER 2015

Subject Code: 140104**Date: 08/06/2015****Subject Name: Fundamentals of Aeronautics (Institute Elective-1)****Time: 10.30am-01.00pm****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) Classify aircraft engines. **07**
(b) What three types of structures are used to construct fuselage? **07**
- Q.2** (a) Mention main structural components of aircraft wings? How they are differ than helicopter main rotor blades. **07**
(b) What are the primary functions of tail plane sections? **07**
- OR**
- (b) What are ailerons? Why they always operated opposite in direction? Explain briefly? **07**
- Q.3** (a) What is trim tab? How does it relax pilot in air? **07**
(b) Enlist and explain the factors affecting flight performance of aircraft. **07**
- OR**
- Q.3** (a) How an aircraft maneuvers in air? **07**
(b) Explain Brayton cycle of a gas turbine engine. **07**
- Q.4** (a) What is the main function of turbine and after burner and thrust reverser in aviation gas turbine engines? **07**
(b) Define and very shortly explain- Centre of gravity, Centre of Pressure, Aerodynamic Centre, Air Speed. **07**
- OR**
- Q.4** (a) What are advantages and disadvantages of retractable landing gears? **07**
(b) Briefly explain three axis and four forces acting upon an airplane. **07**
- Q.5** (a) Classify static and dynamic stability of aircraft. **07**
(b) Differentiate between aircraft and helicopter. **07**
- OR**
- Q.5** (a) What is airfoil? How does this shape produce lift over the wing? **07**
(b) Explain $C_L-\alpha$ curve of symmetrical and asymmetrical airfoils. **07**
