

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-IV Examination June- 2010

Subject code: 140104

Date: 21 / 06 /2010

Subject Name: Fundamentals of Aeronautics

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) Enlist types of jet engines. Explain any two with figure. **07**
(b) Explain about Mach Number. **04**
(c) State characteristics of aircraft structures. **03**
- Q.2** (a) Write different materials available for aircraft materials and explain about composite materials. **07**
(b) Considering inplane shear forces explain why flat panel is preferable over curved panel for aircraft structure. **07**
- OR**
- (b) How combination of spars and cover-skin will be useful in wing constructions to increase torsional resistance. **07**
- Q.3** (a) With help of sketch explain three types of dynamic stability about longitudinal axis. **08**
(b) Explain keel effect. **03**
(c) Explain about parasite drag. **03**
- OR**
- Q.3** (a) With help of sketch explain three types of dynamic stability about lateral axis. **08**
(b) Explain about dihedral angle and anhedral angle. **03**
(c) Explain about interference drag. **03**
- Q.4** (a) Explain functions of secondary control surfaces. **10**
(b) Why I section is preferred over rectangular section for aircraft structure? **04**
- OR**
- Q.4** (a) Explain how thrust is generated by propeller and draw propeller vector diagram. **10**
(b) Explain monocoque and semi-monocoque construction. **04**
- Q.5** (a) Prove that at minimum thrust requirement zero-lift drag equals drag due to lift. **07**
(b) Derive equation of motion of an aircraft for level flight. **07**
- OR**
- Q.5** (a) Prove that zero-lift drag is one-third of the drag due to lift at minimum power requirement. **07**
(b) Draw the sketch of an aircraft and labeled it with different control surfaces and major components. **07**
