

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEM-VIII Examination May 2012

Subject code: 180101

Subject Name: Aircraft Design-II

Date: 10/05/2012

Time: 10.30 am – 01.30 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** Using scale draw a neat sketch of conventional military aircraft cockpit as per 14
under mentioned data.
Over nose angle = 10° and Seat back angle = 13°
Seat height = 8'' from the floor
Seat length = 14'' and Seat travel (Longitudinally) = 1 foot either side.
Eye point location = 32'' from upper edge of seat and 13'' from head rest.
Instrument panel clearance = 17'' from eye point,
Grazing Angle = 30° , Instrument panel is 20° inclined with Vertical plane.
Rudder pedal distance or Firewall Distance = 50'' (From seat back)''
Foot Length = 12''
Overhead canopy clearance = 1 foot from eye point.
Scale: 1cm = 4''
- Q-2 A** In above mentioned data add canopy curve considering that a pilot can see 07
upward at equal angle to over nose angle.
B With neat sketch explain how VTOL or tilt rotor aircraft performs its 07
manoeuvres around all three axes?
OR
B Explain Aircraft Layout Procedure. 07
- Q-3 A** Give a short note on "Fixed Engine Sizing". 07
B What is the importance of "Tail volume coefficient" in Tail plane design? 07
OR
- Q-3 A** How will you determine Diameter of Main wheels and Nose wheel. Shortly explain 07
procedure with neat sketch.
B What is the importance of the directions of propellers rotation of tilt rotor aircrafts? 07
- Q-4 A** What are the reasons behind low aspect ratio of military aircrafts? What are other 07
technics to make a military aircraft more manoeuvrable?
B How can we increase "Producibility" of an aircraft by changing design? 07
OR
- Q-4 A** Explain considerations to choose Piston Engine location. Which considerations are to 07
be taken while designing Pusher and Tractor Propeller engine cowl?
B With neat sketch explain Castoring wheel geometry. 07
- Q-5 A** What do you understand by "Inertial Loads"? While designing an aircraft structure 07
which components create inertial loads? Which technics are used to overcome from

inertial loads?

- B** What are the properties of Titanium which leads it to widely used to produce airframe structural components? **07**

OR

- Q-5 A** Give a short note on VTOL jet propulsion technics with neat sketch. **07**

- B** Explain types of vectoring nozzles for VTOL aircrafts. **07**
