

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VIII(NEW) EXAMINATION – SUMMER 2019****Subject Code: 2180101****Date: 15/05/2019****Subject Name: Aircraft Design II****Time: 10:30 AM TO 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.
4. Use drawing instruments for sketches.
5. Attempt Q-1 and Q-2 (a),(b) in drawing sheet as per appropriate scale.

**MARKS**

- |            |     |   |           |
|------------|-----|---|-----------|
| <b>Q.1</b> | (a) | Only draw conventional tail plane configuration such a way that maximum area of vertical fin should be covered with free stream while stall.      | <b>03</b> |
|            | (b) | Only draw conic lofting curve between two axis having 12 cm each. Take appropriate shoulder point.  | <b>04</b> |
|            | (c) | Only draw circle to square adopter. Where one end is having 10 cm diameter and other hand is having square of 10 X 10 cm.                         | <b>07</b> |
| <b>Q.2</b> | (a) | Draw layout of horizontal stabilizer having span of 50 feet, root chord of 12 feet, tip chord of 4 feet and leading edge sweep back angle of 28°. | <b>03</b> |
|            | (b) | Only draw geometric aerodynamic centre of the wing having chord of 22 feet, tip of 4 feet, wing span of 100 feet and taper wing layout.           | <b>04</b> |
|            | (c) | Explain aerodynamic consideration for empennage design.   | <b>07</b> |
|            |     | <b>OR</b>   |           |
|            | (c) | Explain structural considerations with neat sketches.   | <b>07</b> |
| <b>Q.3</b> | (a) | What are considerations to design weapon carriage?  | <b>03</b> |
|            | (b) | Only draw passenger compartment having seating arrangement of 3X3. Mention overhead baggage and aisle too.  | <b>04</b> |
|            | (c) | How will you reduce radar detectability of a supersonic jet fighter aircraft?   | <b>07</b> |
|            |     | <b>OR</b>   |           |
| <b>Q.3</b> | (a) | Discuss ideal locations for gun installation.   | <b>03</b> |
|            | (b) | Discuss swash plate mechanism with neat sketch.   | <b>04</b> |
|            | (c) | Discuss design of hull of a sea or float plane.   | <b>07</b> |
| <b>Q.4</b> | (a) | How will you improve crashworthiness of a jet transport aircraft?   | <b>03</b> |
|            | (b) | How will you arrange base and track distances for tricycle type landing gear.   | <b>04</b> |
|            | (c) | Discuss gear retraction geometry with neat sketch.  | <b>07</b> |

**OR**

- Q.4** (a) How will you control aural signature of a fighter aircraft? **03**  
(b) Discuss any two techniques to reduce infrared detectability of a fighter aircraft having afterburner. **04**  
(c) Discuss various jet VTOL configurations with neat sketch. **07**
- Q.5** (a) Discuss only one type of jet VTOL configurations with neat sketch. **03**  
(b) How will you decide turning radius of an aircraft having tricycle landing gear geometry? **04**  
(c) How will you arrange fuselage with wing layout? Explain with neat sketch. **07**

**OR**

- Q.5** (a) Explain function of tail rotor in conventional helicopter. **03**  
(b) Explain geometry of a crew station of a jet fighter. **04**  
(c) With neat sketch explain conic lofting technique. **07**

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