Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2130106 **Date: 09/06/2017**

Subject Name: Aircraft Science and Manufacturing Processes

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.**

MARKS

Q.1 Short Questions **14**

1 The direction of lift is_____

2 The direction of weight is _____

3 The direction of thrust is _____

4 The direction of drag is _____

5 _____ control surface is responsible for Pitching.

6 _____ control surface is responsible for Rolling

7 _____ control surface is responsible for Yawing.

8 ____ secondary control surface increases drag and lift both when lowered.

9 ____ secondary control surface increases drag and decreases lift when deployed.

10 ____ secondary control surface makes no change in lift but increases drag when deployed.

11 ____ secondary control surface increases critical angle of attack of airfoil.

12 Define Centre of Gravity of aircraft.

13 Define Centre of Pressure of wing.

14 Define Aerodynamic Centre of wing.

Q.2 (a) What should be the direction of grain for particular component of wood part of a glider? **03**

(b) Classify glues. Explain their applications. **04**

(c) How will you replace wooden gusset if broken? Explain with respect to truss type fuselage construction. **07**

OR

(c) How will you store aircraft wood before construction? **07**

Q.3 (a) Explain any one type of sheet metal bending techniques. **03**

(b) Only draw types of rivets used for sheet metal construction of aircraft. **04**

(c) Draw and explain construction of junction of former, skin and longeron **07**

or stiffener.

OR

Q.3	**(a)**	Enlist factors affecting sheet metal parts and joints design.	**03**
	(b)	Explain riveting process shortly.	**04**
	(c)	Explain any one bench mounted sheet metal sheering machine with neat sketch.	**07**
Q.4	**(a)**	Discuss types of steel tubes using for aircraft construction.	**03**
	(b)	How will you inspect welded steel tube fuselage structure in case of hard landing takes place?	**04**
	(c)	Draw and explain any three types of junctions of welded steel tube fuselage construction having gussets.	**07**

OR

Q.4	**(a)**	Explain soldering process.	**03**
	(b)	Explain brazing process.	**04**
	(c)	How will you construct aluminum tubing wing rib using gussets, tubes, and rivets?	**07**
Q.5	**(a)**	Only draw jig of a truss type wooden wing rib structure.	**03**
	(b)	Shortly explain equipments used for painting on fabric covering.	**04**
	(c)	How will you paint aircraft having semi monocoque fuselage fabricated with 2024-T3 Aluminum alloy?	**07**

OR

Q.5	**(a)**	Only draw layout of structure of a sheet metal wing rib wing.	**03**
	(b)	How will you text aircraft registration on fabric covered fuselage?	**04**
	(c)	How will you cover and reinforce a wooden wing with fabric covering?	**07**

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