

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– III (NEW) EXAMINATION – SUMMER 2022

Subject Code:3130108

Date:13-07-2022

Subject Name:Fundamentals of Aeronautical Engineering

Time:02:30 PM TO 05:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.
5. Use drawing instruments to make figures.

MARKS

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|------------|-----|--|-----------|
| Q.1 | (a) | Differentiate between chord line and mean camber line. | 03 |
| | (b) | Explain importance of Lift, Weight, Thrust and Drag for conduction of flight of a fix wing aircraft. | 04 |
| | (c) | Explain how low pressure is generated on upper surface with respect to bottem surface over a conventional cambered airfoil ? | 07 |

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|------------|-----|--|-----------|
| Q.2 | (a) | Define Critical Mach Number. Why is it always less than 1 mach? | 03 |
| | (b) | Differentiate between spoiler and air break. | 04 |
| | (c) | With neat sketch explain function of devices responsible for rolling, pitching and yawing. | 07 |

OR

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| | (c) | Draw and explain importance of sweep back, delta wing and tapered wing. | 07 |
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| Q.3 | (a) | What is the reason that horizontal stabilizer and vertical fin are fitted aft of the fuselage? | 03 |
| | (b) | Briefly explain why aircraft can not fly by increasing angle of attack more than 16° ? | 04 |
| | (c) | With neat sketch explain how low bypass turbo fan engine or turbojet engine works? | 07 |

OR

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|------------|-----|--|-----------|
| Q.3 | (a) | Differentiate among various speeds with respect to mach numbers. | 03 |
| | (b) | Differentiate between angle of attack and angle of incidence. | 04 |
| | (c) | Draw structure of wing with nomenclature. Mention Spars, Ribs, Stringers, Skin Panels, Ailerons, Aileron Trim Tabs, Flaps, Spoilers etc. | 07 |

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| Q.4 | (a) | Differentiate between fixed and retractable landing gear. | 03 |
| | (b) | Differentiate between tricycle and tail dragger undercarriage arrangement.. | 04 |

- (c) What types of cylinder heads arrangements are available for piston engines used specially for aircrafts? **07**
- OR**
- Q.4** (a) Only draw semimonocoque fuselage air frame construction with nomenclature. Mention bulkheads, longerons or stringers, formers, skin panel etc. **03**
- (b) Only draw structure of horizontal stabilizer showing Spars, skin panels, stringers, elevator, leading and trailing edges, tip fairing, elevator trim tab. **04**
- (c) Draw and explain construction of a monocoque fuselage. Mention all structural components in drawing of monocoque fuselage. **07**
- Q.5** (a) Shortly explain how Radio Altimeter works. What is Decision height? **03**
- (b) Explain advantages of Microwave landing system over Instrument Landing System. **04**
- (c) Briefly explain weather monitoring equipment of a fix wing aircraft. **07**
- OR**
- Q.5** (a) What type of data can a pilot collect from Global Positioning System? **03**
- (b) Differentiate between Primary Ground Radar and Secondary Surveillance radar. **04**
- (c) Briefly explain ADF- NDB Navigation. **07**
