Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – SUMMER • 2014

Subject Code: 140104 Date: 25-06-2014

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)**	Define: Mach Number, Critical Mach number, Airfoil Stalling, Angle of Attack, Range, Endurance and Drag divergence mach number.	**07**
	(b)	Explain Airfoil Nomenclature with a neat sketch.	**07**
Q.2	**(a)**	Derive power required for a steady level unaccelerated flight and also derive necessary conditions for minimum power requirement.	**07**
	(b)	Explain Critical mach number and critical pressure coefficient. Show the comparison of C_p and M_∞ for airfoils of different thicknesses.	**07**
		OR	
	(b)	Explain climbing flight of an aircraft with a neat diagram.	**07**
Q.3	**(a)**	Show the comparison of $C_L - \alpha$ curve for symmetric and cambered airfoil.	**07**
	(b)	Explain the wing and tail structure of transport aircraft.	**07**
		OR	
Q.3	**(a)**	Define propeller. Explain turboprop engine with a neat sketch.	**07**
	(b)	Explain gliding flight.	**07**
Q.4	**(a)**	Write a note on reciprocating engine and its working.	**07**
	(b)	With a neat sketch explain Turboshaft engine with advantages and disadvantages.	**07**
		OR	
Q.4	**(a)**	With a neat sketch write a note on Ramjet engine with advantages and disadvantages.	**07**
	(b)	Derive rocket equation.	**07**
Q.5	**(a)**	Write a note on landing gears and types of lading gears.	**07**
	(b)	Derive breguet range formula for propeller driven airplane.	**07**
		OR	
Q.5	**(a)**	Explain the fuselage structure of transport aircraft.	**07**
	(b)	Explain turbojet engine in brief.	**07**

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