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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 150101 **Date: 08/05/2017**

Subject Name: Flight Mechanics

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.**

Q.1	**(a)**	What is International standard atmosphere? Explain the variation of temperature with altitude in standard model of atmosphere.	**07**
	(b)	Explain V-N Diagram.	**07**
Q.2	**(a)**	Draw the lift curve for a symmetrical airfoil and hence explain the stalling of an airfoil with the reasons responsible for stalling.	**07**
	(b)	Classify airfoils with neat sketches.	**07**
		OR	
	(b)	What is Drag and Lift? Explain in details.	**07**
Q.3	**(a)**	Define stability, control and moments with appropriate example.	**07**
	(b)	Derive equation for range and endurance for jet engine propelled aircraft. Base on mathematical equation justify dependency of range and endurance on various parameters.	**07**
		OR	
Q.3	**(a)**	Write notes on drag reduction techniques.	**07**
	(b)	Discuss effect of thrust / weight ratio on flight performance.	**07**
Q.4	**(a)**	List advantages, disadvantages and difference of swept back wing compare to conventional wing.	**07**
	(b)	Define pressure coefficient and critical pressure coefficient.	**07**
		OR	
Q.4	**(a)**	Differentiate between static and dynamic stability.	**07**
	(b)	Classify different types of stall with neat sketch.	**07**
Q.5	**(a)**	Derive the equation for liftoff distance.	**07**
	(b)	Define pressure coefficient and derive the relation to obtain lift coefficient from Cp.	**07**
		OR	
Q.5	**(a)**	Explain how time to climb can be graphically calculated.	**07**
	(b)	Derive the condition for Optimum power requirement during steady level flight.	**07**

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