

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  $C_p$ . **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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