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**Eighth Semester B.E. Degree Examination, Dec.2018/Jan.2019**  
**Flight Vehicle Design**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting  
at least TWO questions from each part.**

**PART - A**

- 1 a. Define design. Briefly explain the design process of an aircraft with a flow chart. (10 Marks)  
 b. Sketch the flight plans of commercial and typical military aircraft and explain their different phases in the flight plan in brief. (10 Marks)
- 2 a. Derive an expression for take off distance in relation to using loading effect on take-off. (10 Marks)  
 b. Deduce an expression for wing loading effect on acceleration to prove  $\frac{\omega}{s} = \frac{q}{n} C_{Lmin}$ . (10 Marks)
- 3 a. Interpret the volume consideration for landing gear placement. (10 Marks)  
 b. Deduce an expression for total viscous drag on the fuselage. (10 Marks)
- 4 a. Explain briefly various parameters considered for propulsion system selection. (10 Marks)  
 b. List the necessary correction factors to overcome installed thrust errors. (10 Marks)

**PART - B**

- 5 a. Write an expression for landing ground roll and obtain an expression for landing ground roll distance. (10 Marks)  
 b. Explain the three common approaches used for active lift enhancement with the help of a neat sketch. (10 Marks)
- 6 a. Explain neutral point, C.G margin and static margin with a neat sketch. (10 Marks)  
 b. Deduce an expression for lift co-efficient of horizontal tail arrangement with respect to longitudinal stability. (10 Marks)
- 7 a. Explain three commonly used landing gear arrangements. (10 Marks)  
 b. Explain Anti-icing and deicing system in an aircraft. (10 Marks)
- 8 a. Write a short note on:  
     (i) Radio navigation system. (10 Marks)  
     (ii) Aircraft weapon system. (10 Marks)  
 b. Explain briefly primary and secondary flight control system. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.