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Eighth Semester B.E. Degree Examination, June/July 2016
Flight Vehicle Design

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, selecting
atleast 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. Mention the performance parameter for designing an aircraft. (10 Marks)
- 2 a. Derive an expression for wing loading effect on Glide rate. (10 Marks)
 b. Define Load Factor. Show that the designer can minimize $\frac{D}{W}$ with respect to $\frac{W}{S}$ with the
 relation $\frac{W}{S} = \frac{q}{n} C_{\left(\frac{L}{D}\right)_{\min}}$ (10 Marks)
- 3 a. Write short notes on the following :
 (i) Airfoil shape selection
 (ii) Base Drag Estimation. (10 Marks)
 b. Mention and briefly explain the volume consideration mode while designing an aircraft fuselage. (10 Marks)
- 4 a. Discuss the following topics in detail:
 (i) Propulsion selection
 (ii) Propeller Design for cruise condition (10 Marks)
 b. Explain the spread shut approach for Turbo-Jet engine sizing. (10 Marks)

PART – B

- 5 a. Derive an expression for aircraft ground roll. (10 Marks)
 b. Enlist all phases of flight landing with schematic sketch and mention all the expression related to each phase. (10 Marks)
- 6 a. Discuss briefly any two refined weight estimation methods used in aircraft. (10 Marks)
 b. Explain longitudinal stability effect on performance of the aircraft. (10 Marks)
- 7 a. Sketch and explain three commonly used landing gear arrangements. (10 Marks)
 b. Explain anti icing and de-icing system in an aircraft. (10 Marks)
- 8 a. Explain a typical flight control system. (10 Marks)
 b. Write short notes on :
 (i) Radio navigation system
 (ii) Aircraft weapon system. (10 Marks)

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