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10AE81

Eighth Semester B.E. Degree Examination, Feb./Mar. 2022
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. Explain in brief Aircraft design stages. **(08 Marks)**

b. Discuss the take – off weight and empty weight estimation made for the New Aircraft design. **(07 Marks)**

c. What is Mission profile? Explain by choosing any Aircraft. **(05 Marks)**

2 a. Explain Wing loading and its effect on Landing , Climb and Acceleration. **(10 Marks)**

b. Show how a designer can minimize the D/W with respect to W/S with relation $\frac{W}{S} = \frac{q}{n} C_{\ell_{nd}}$. **(10 Marks)**

3 a. With the help of spreadsheets, explain Wing design. **(10 Marks)**

b. Explain Airfoil shape selection criteria. **(10 Marks)**

4 a. Explain the Propulsion selection Criteria. **(10 Marks)**

b. Explain "Installed Thrust Correction". **(10 Marks)**

PART – B

5 a. Discuss on Lift Enhancement Considerations. **(10 Marks)**

b. With neat sketch, explain Take – Off phases. **(10 Marks)**

6 a. Brief on Control Surface Sizing and its considerations while designing (take any one control surface). **(10 Marks)**

b. Explain Longitudinal Static Stability and how we achieve it with desired list of criteria. **(10 Marks)**

7 a. Explain Ice – Protection System working on the wing section of Aircraft. **(10 Marks)**

b. Explain Landing gear and its subsystems. **(10 Marks)**

8 a. Discuss on Weapon System Interface System. **(10 Marks)**

b. How Radar works on the Fighter Airplane? **(10 Marks)**

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