CBCS SCHEME

USN | | | | | | | | | | |

18AE81

Eighth Semester B.E. Degree Examination, Dec.2023/Jan.2024
Flight Vehicle Design

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Explain conceptual design process with flow chart. **(10 Marks)**

b. Define thrust loading. Write the equation for using loading effect on take off and landing. **(10 Marks)**

OR

2 a. Explain aircraft mission requirement. **(10 Marks)**

b. Describe preliminary estimate of take off weight for an aircraft. **(10 Marks)**

Module-2

3 a. What is lofting? Discuss the fuselage conic lofting configuration. **(10 Marks)**

b. Draw a typical V-N diagram for an aircraft and explain the important curves. Also draw the gust envelope of the typical aircraft. **(10 Marks)**

OR

4 a. With a neat sketch and equation explain the concept of using layout and loft. **(10 Marks)**

b. Explain concept of Horizontal and Vertical tail design. **(10 Marks)**

Module-3

5 a. Discuss the take off analysis with neat sketch. **(10 Marks)**

b. With neat sketch and equation, explain the achieve lift enhancement. **(10 Marks)**

OR

6 a. Explain the Turbojet engine sizing. **(10 Marks)**

b. Describe the steps of propeller design for cruise. **(10 Marks)**

Module-4

7 a. Write the pitching moment equation for trim conditions of longitudinal static stability. **(10 Marks)**

b. Discuss lateral directional stability of aircraft with momentum equation. **(10 Marks)**

OR

8 a. Describe the handling qualities of an aircraft cooper Harper rating scale. **(10 Marks)**

b. Write short note on environmental constraint of general aviation. **(10 Marks)**

Module-5

9 a. Explain the landing gear arrangement with any one of the subsystem sizing. **(10 Marks)**

b. Write short note on material selection for a typical aircraft. **(10 Marks)**

OR

10 a. Explain the Air pressurization and air conditioning system. **(10 Marks)**

b. Describe the electric power system and avionics system for on aircraft. **(10 Marks)**

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