CBCS SCHEME

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

21AE641

Sixth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
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 the performance aspects specified by mission requirements. **(10 Marks)**
b. Explain fuel fraction estimate for typical flight plan involving commercial aircraft. **(10 Marks)**

OR

2 a. Explain the wing loading effect on takeoff and landing. **(10 Marks)**
b. Explain the spread sheet structure for takeoff weight estimate. **(10 Marks)**

Module-2

3 a. What are quantitative fuselage shapes? **(10 Marks)**
b. With a neat sketch explain the determination of wetted area. **(10 Marks)**

OR

4 a. Draw a typical VN diagram and gust envelop for an aircraft and explain. **(10 Marks)**
b. Briefly explain various tail arrangements with sketches. **(10 Marks)**

Module-3

5 a. Define Installed thrust and explain the installed thrust corrections. **(10 Marks)**
b. Explain the spread sheet structure for turbojet engine sizing. **(10 Marks)**

OR

6 a. Derive an expression for landing ground roll distance. Also draw the figure indicating phases. **(10 Marks)**
b. Explain the passive lift environment techniques. **(10 Marks)**

Module-4

7 a. Explain different ways of getting lateral directional stability in aircraft. **(10 Marks)**
b. Explain the criteria for rudder area sizing. **(10 Marks)**

OR

8 a. Describe the handling qualities of an aircraft according to cooper harper rating scale. **(10 Marks)**
b. Discuss briefly about refined weight estimation. **(10 Marks)**

Module-5

9 a. Briefly explain weapon carriage and launch mechanism in military aircraft. **(10 Marks)**
b. Sketch and explain any three commonly used landing gear arrangement. **(10 Marks)**

OR

10 a. Explain the flight control system. **(10 Marks)**
b. Explain anti-icing and deicing systems in aircraft. **(10 Marks)**

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