CBCS SCHEME

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

18AE81

Eighth Semester B.E. Degree Examination, June/July 2023
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 in detail the conceptual design phase in Aircraft design. **(10 Marks)**

b. With the help of neat diagram, describe various mission profiles and explain mission segment weight fractions for simple Cruise. **(10 Marks)**

OR

2 a. Describe Thrust matching and Wing loading in the design of Aircraft with suitable sketches and equations. **(10 Marks)**

b. With the help of relevant equations, explain the wing loading for Cruise and Loiter Endurance. **(10 Marks)**

Module-2

3 a. Describe the process of development of configuration layout from conceptual sketch. List the outcomes. **(10 Marks)**

b. With the help of relevant sketches, explain the determination Wetted Area and Volume distribution in configuration layout. **(10 Marks)**

OR

4 a. Explain the design of weapon carriage in an Aircraft layout, with neat sketches. **(10 Marks)**

b. Describe the various wing vertical location and wing tips with suitable sketches. **(10 Marks)**

Module-3

5 a. Describe the process of Rubber engine and Fixed engine sizing of the Aircraft. **(10 Marks)**

b. Estimate takeoff analysis and explain all the segments involved during takeoff with neat sketch. **(10 Marks)**

OR

6 a. Describe Jet Engine Integration and the method involved in estimating the installed thrust. **(10 Marks)**

b. Estimate Landing Analysis and explain all the segments involved during landing, with neat sketches. **(10 Marks)**

Module-4

7 a. Describe Longitudinal Static Stability and explain the main contribution of pitching moment, with a neat sketch. **(10 Marks)**

b. With the help of Cooper – Harper Scale explain the various flying qualities of an Aircraft. **(10 Marks)**

OR

8 a. Describe Lateral Static stability and explain the main contribution of pitching moment with a neat sketch. **(10 Marks)**

b. Briefly describe the methods of Aileron Elevator and Rudder Sizing with relevant sketches and equations. **(10 Marks)**

Module-5

9 Describe the following with relevant sketches and suitable equations :

a. Flight control system. **(10 Marks)**

b. Landing gear arrangements. **(10 Marks)**

OR

10 Describe the following with relevant sketches and suitable equations :

a. Hydraulic and Pneumatic system. **(10 Marks)**

b. Cabin Pressurization and Air Conditioning. **(10 Marks)**

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