CBCS SCHEME

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18AE81

Eighth Semester B.E. 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. Describe about the overview of the design process and phases of aircraft design. **(10 Marks)**

b. With the help of neat diagrams describe the various mission profiles. Explain mission segment weight fraction for simple cruise. **(10 Marks)**

OR

2 a. With the help of relevant expression describe the wing loading for
i) Loiter Endurance ii) Instantaneous Turn **(10 Marks)**

b. Define Thrust Matching. Describe power loading and statistical estimation of thrust to weight ratio of an aircraft. **(10 Marks)**

Module-2

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

b. With the help of neat sketches explain the design of crew station in an aircraft layout. **(10 Marks)**

OR

4 a. Describe the process of conic lofting used in the development of using and fuselage and explain conic lofting. **(10 Marks)**

b. With the help of neat sketches, explain the design of passenger compartment in an aircraft layout. **(10 Marks)**

Module-3

5 a. Illustrate the process of Rubber engine sizing involved in initial siding of the aircraft. **(10 Marks)**

b. Estimate Takeoff Analysis and explain all the segment involved during takeoff with neat sketch. **(10 Marks)**

OR

6 a. Explain the segment involved during landing with equation and draw the neat sketch with estimation of landing analysis. **(10 Marks)**

b. Describe the process of fixed engine sizing involved in the initial siding of an aircraft. **(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 illustrate the various flying qualities of an aircraft. **(10 Marks)**

OR

8 a. Describe lateral static stability and explain the main contribution of facing moment with a neat sketch. **(10 Marks)**

b. Explain the various environmental constraints involved in the operation of a flight. **(10 Marks)**

Module-5

9 Briefly demonstrate the working of the following subsystem of an aircraft
i) Hydraulic system ii) Electrical system **(20 Marks)**

OR

10 Demonstrate the working of the following subsystem with relevant sketches
i) Pneumatic system ii) Communication system. **(20 Marks)**

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