

CBCS SCHEME

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17AE82

Eighth Semester B.E. Degree Examination, July/August 2021 Flight Vehicle Design

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 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)
- 2 a. Explain the aircraft mission requirements. (10 Marks)
b. Describe the preliminary estimate of take-off weight for an aircraft. (10 Marks)
- 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)
- 4 a. With neat sketch and equations explain the concept of using layout and loft. (10 Marks)
b. Explain the concept of Horizontal and Vertical tail design. (10 Marks)
- 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)
- 6 a. Explain the Turbojet engine sizing. (10 Marks)
b. Describe the steps of propeller design for cruise. (10 Marks)
- 7 a. Write the pitching moment equation for trim condition of longitudinal static stability. (10 Marks)
b. Discuss lateral directional stability of aircraft with momentum equations. (10 Marks)
- 8 a. Describe the handling qualities of an aircraft Cooper-Harper rating scale. (10 Marks)
b. Write a short note on environmental constraints of general aviation. (10 Marks)
- 9 a. Explain landing gear arrangement with any one of the subsystem sizing. (10 Marks)
b. Write a short note on material selection for a typical aircraft. (10 Marks)
- 10 a. Explain the Air pressurization and air conditioning system. (10 Marks)
b. Describe the electric power system and avionics system for an aircraft. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.