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10AE81

Eighth Semester B.E. Degree Examination, Aug./Sept. 2020
Flight Vehicle Design

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting atleast TWO questions from each part.

PART – A

- 1 a. Draw a flow chart for the aircraft design process. (10 Marks)
b. Explain the phases of aircraft design. (10 Marks)
- 2 a. Explain the take-off weight build up and the empty weight estimation for a new aircraft design. (10 Marks)
b. Explain conic lofting and conic layout. (05 Marks)
c. Explain conic layout using conic shape parameter. (05 Marks)
- 3 a. Explain the selection criteria for the followings :
i) Aerofoil shape
ii) Wing Taper ratio
iii) Wing leading edge sweep angle. (10 Marks)
b. Draw a typical V-n diagram and gust envelope. (10 Marks)
- 4 a. Draw a typical spread sheet for wing design. (10 Marks)
b. Draw a spread sheet for fuselage design. (10 Marks)

PART – B

- 5 a. Explain turbojet engine sizing and installed thrust correction. (10 Marks)
b. Explain propeller design for cruise. (10 Marks)
- 6 Explain the followings :
a. Castoring – wheel geometry
b. Landing gear arrangements
c. Types of shock – absorbers
d. Solid – spring gear sizing. (20 Marks)
- 7 a. Explain the flight control linkage systems with figure. (10 Marks)
b. Explain propeller – engine integration. (10 Marks)
- 8 a. Draw a simplified bleed air system with associated aircraft systems. (10 Marks)
b. What is multiple redundancy actuation and the need for trim. (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.