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)

* * * * *