CBCS SCHEME

USN | | | | | | | | | |

17AE63

Sixth Semester B.E. Degree Examination, Dec.2023/Jan.2024
Aircraft Performance

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Draw and explain the forces acting on the aircraft with equations.
(i) When aircraft is perpendicular to the surface of the earth
(ii) When aircraft is horizontal plane parallel to the flat earth. **(10 Marks)**
b. Analyze minimum P_R and minimum P_R point. **(10 Marks)**

OR

2 a. Explain altitude effects on P_R. **(10 Marks)**
b. Explain P_A curve for propeller aircraft. **(10 Marks)**

Module-2

3 a. Derive the expressions for rate of climb in terms of design parameters. **(10 Marks)**
b. For idealized jet airplane, best rate of climb does not occur at minimum P_R, explain. **(10 Marks)**

OR

4 a. With neat diagram, explain R/C : effect of the altitude. **(10 Marks)**
b. Explain hodograph for unpowered flight. **(10 Marks)**

Module-3

5 a. Derive the expression for maximum endurance for reciprocating engine/propeller. **(10 Marks)**
b. Derive Generalized Range equation. **(10 Marks)**

OR

6 a. Derive Breguet endurance equation for propeller driven airplane. **(10 Marks)**
b. Derive general range equation for propeller driven airplane. **(10 Marks)**

Module-4

7 a. Describe various types of velocity during Take Off with neat labelled diagram. **(10 Marks)**
b. Derive lift-off distance for a jet airplane. **(10 Marks)**

OR

8 a. With neat diagram, derive (i) f_R (ii) S_a **(10 Marks)**
b. Derive the expression for S_g, landing roll. **(10 Marks)**

Module-5

9 a. What is turn? **(05 Marks)**
b. Derive the expression for pull up and pull down with neat labelled diagram. **(10 Marks)**
c. Derive the expression for minimum turn radius. **(05 Marks)**

OR

10 a. Describe the objectives of V-n diagram. **(07 Marks)**
b. Explain the limits of V-n diagram. **(07 Marks)**
c. Describe corner velocity. **(06 Marks)**

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