Reg. No. : | | | | | | | | | | | | |

Question Paper Code:1015020

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV/ DEC 2024
Fifth Semester
Aeronautical Engineering
U20AE501 – FLIGHT DYNAMICS
(Regulation 2020)
(Common to Aerospace Engineering)

Time: Three Hours | Maximum: 100 Marks

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. Define SFC & TSFC.

2. What is Profile drag and Induced drag?

3. Define rate of turn.

4. Define Absolute Ceiling and Service Ceiling.

5. What is meant by static margin?

6. What is meant by Longitudinal static stability of an airplane?

7. List out the types of aerodynamic balancing.

8. Define dihedral angle.

9. Write about rudder lock?

10. What is meant by weather cock effect?

PART – B (5 x 16 = 80 Marks)

11. (a) (i) Derive the equation of motion for an airplane at steady level flight condition. (8)

(ii) What is drag? Explain about the various types of drag. (8)

(OR)

(b) Derive the thrust required and power required for an airplane. (16)

12. (a) What is meant by climbing? Explain in detail about the time taken to climb an airplane from an altitude 'h' to some other higher altitude. (16)

(OR)

(b) How can we measure the distance travelled by an airplane (both propeller driven and jet propelled) on one load fuel? Derive it. (16)

13. (a) Derive the LSS equation for stick fixed condition for an Aircraft with its wing and tail contribution. (16)

(OR)

(b) Explain in detail about the Direct and Indirect power effects of an airplane. (16)

14. (a) (i) Explain in detail about the rudder requirements and rudder lock. (8)
(ii)What is meant by dihedral effect? Explain in detail with neat sketch. (8)

(OR)

(b) (i) Explain about one engine inoperative condition. (8)
(ii) Describe how the lateral control can be achieved in an airplane? (8)

15. (a) (i) Explain the effect that an airplane experiences during the Dutch Roll. (8)
(ii) Enumerate in detail about the spin and its recovery. (8)

(OR)

(b) (i) How spiral divergence occurs in an airplane? Explain it. (8)
(ii) Explain about the directional stability of an airplane. (8)

------xxxx-----