445 Register No.:

April 2019

Time – Three hours
(Maximum Marks: 75)

(N.B: (1) Q.No. 8 in PART – A and Q.No. 16 in PART – B are compulsory. Answer any FOUR questions from the remaining in each PART – A and PART – B

(2) Answer division (a) or division (b) of each question in PART – C.

(3) Each question carries 2 marks in PART – A, 3 marks in Part – B and 10 marks in PART – C.)

PART – A

1. List out the layers of atmosphere.
2. Define centre of pressure.
3. What is steady state flight?
4. What is load factor?
5. Classify the wind tunnels based on mach number.
6. List the type of wind tunnels.
7. Define buffeting.
8. Define mach number.

PART – B

9. Define standard atmosphere.
10. Define aerodynamic centre.
11. What is glide ratio?
12. Name some of the high lift devices.
13. What are the primary control surfaces?
14. What is induced drag? Mention some of the use of it.
15. Describe critical mach number.
16. How is test section air speed determined in a low speed subsonic wind tunnel?

[Turn over....

PART – C

17. (a) Explain in detail about the various layers and its structure of earth's atmosphere.

(Or)

(b) Explain briefly about the different types of drag associated with an airplane.

18. (a) Explain with sketches in detail about the various aerodynamic forces that acts on aircraft.

(Or)

(b) Explain the significance of V-n diagram with a neat diagram.

19. (a) With neat sketches, explain in detail about conventional control and powered control systems used in airplanes.

(Or)

(b) How does the function of roll, pitch and yaw in an airplane? Explain with neat sketches.

20. (a) With a neat diagram, explain the working of open and closed circuit subsonic tunnels.

(Or)

(b) Explain in detail classification of wind tunnels.

21. (a) What is critical mach number? Describe clearly the role of critical mach number in aircraft.

(Or)

(b) With a sketch, explain the area ruled aircraft for reduction of drag to breakdown the sound barrier.
