

CBCS SCHEME



18AE34

Third Semester B.E. Degree Examination, June/July 2023 Elements of Aeronautics

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain the main components of helicopter and their functions. (12 Marks)
b. How do you classify aircrafts? Draw a neat chart and explain them in brief. (08 Marks)

OR

- 2 a. Explain with neat sketch monocoque, semimonocoque and truss structures of aircraft with neat sketch. (12 Marks)
b. Discuss in detail about the developments in the material for the aircrafts. (08 Marks)

Module-2

- 3 a. An aircraft carries 40000 lbs, wing area of 350 ft² and wing span 50 ft. At sea level the aircraft flies at 200 and 600 ft/sec. What are the values of induced drag and total drag coefficient? Also calculate coefficient of lift = Weight. Assume $e = 0.85$. (15 Marks)
b. Define Center of pressure and Aerodynamic pressure. (05 Marks)

OR

- 4 a. Write a short notes on types of drag with examples. (10 Marks)
b. Explain how the Bernoulli's theorem used in generation of lift with neat sketch. (10 Marks)

Module-3

- 5 Describe the principles of operation of turboprop, turbojet, turboshaft and turbofan with neat sketch. Mention its advantages and disadvantages. (20 Marks)

OR

- 6 a. Explain the Brayton cycle with T-S and P-V diagram. (10 Marks)
b. Define Thrust Augmentation. Explain its types with neat sketch. (10 Marks)

Module-4

- 7 a. With suitable diagrams describe in detail about the types of stability. (10 Marks)
b. With neat sketch explain the contribution of control surfaces in main aircraft stability and control. (10 Marks)

OR

- 8 a. Explain with a characteristics chart effect of power and altitude on performance of the aircraft. (10 Marks)
b. Write notes on stalling, gliding, landing, climbing and turning of a typical aircraft. (10 Marks)

Module-5

- 9 a. What are the requirements of a typical pneumatic system in an aircraft? (10 Marks)
b. Describe a typical hydraulic system of a light passenger aircraft, with a neat sketch. (10 Marks)

OR

- 10 a. What are the different types of flight control system? Discuss in detail. (10 Marks)
b. With suitable diagrams explain the types of navigation system. (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.