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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 ft^2 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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