| PRN: | | Course Code: | AER2302 |
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Second Year **B. Tech** End Semester Examination Summer 2024

# Elements of Aeronautical Engineering

Day and Date: 24 MAY 2024 , Friday  Max Marks: **100**

Time : 2:00 to 5:00 pm  Duration: **03** hrs

Instructions: All questions are compulsory.

| | | | Marks | Bloom's Level | CO |
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| **Q.1** | | **Attempt the following** | | | |
| | a) | Discuss the classification of flight vehicles. Mention the criteria for classification. | 08 | 1 | 1 |
| | b) | Explain the classification of heavier than air aircraft, with necessary diagrams. | 08 | 2 | 1 |
| | | OR | | | |
| | b) | Explain with neat sketch the components of airplane and their functions. | 08 | 2 | 1 |
| **Q.2** | | **Attempt the following** | | | |
| | a) | Explain the structure of atmosphere by dividing into different layers. | 08 | 2 | 1 |
| | b) | Define drag. List the types of drag and explain each of them. | 08 | 2 | 2 |
| | | OR | | | |
| | b) | What is induced drag? Explain briefly. | 08 | 3 | 2 |
| **Q.3** | | **Attempt any two from the following** | | | |
| | a) | What are the Aerodynamic forces acting on aircraft? Explain | 08 | 1 | 3 |
| | b) | What is NACA? Classify NACA airfoils. | 08 | 2 | 3 |
| | c) | What is Mach number? Explain the different regimes using Mach number with near diagrams. | 08 | 2 | 3 |
| **Q.4** | | **Attempt any two from the following** | | | |
| | a) | What are the general types of construction of fuselage? Explain | 08 | 1 | 3 |
| | b) | What ate the components of wing? Explain the wing structure? | 08 | 2 | 4 |
| | c) | Explain the fuselage structure of an aircraft. | 08 | 3 | 4 |

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| **Q.5** | **Attempt any Two of the following** | | | | |
| | a) | Explain how propeller produces thrust for aircraft propulsion. | 09 | 3 | 4 |
| | b) | What are the merits and limitations of turbojet engine? | 09 | 2 | 4 |
| | c) | With a neat sketch, explain the working of an turbojet engine? | 09 | 3 | 5 |
| **Q.6** | **Attempt any Two of the following** | | | | |
| | a) | Distinguish between turbojet and turboprop. | 09 | 2 | 5 |
| | b) | State and classify rocket engines. | 09 | 2 | 5 |
| | c) | Explain the operation of solid propellant rocket with a neat sketch. | 09 | 3 | 5 |

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