## GBCS SCHEME

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## Third Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 **Elements of Aeronautics**

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M: Marks, L: Bloom's level, C: Course outcomes.

Module - 1
b. With help of a neat sketch, explain the working of a helicopter.  OR  OR  OR  OR  OR  OR  OR  OR  OR  Illustrate the general construction types of wing and fuselages. Explain its components.  b. Discuss the metallic and non-metallic materials used in aircraft applications with suitable examples.  Module - 2  OR  OR  OR  OR  OR  OR  OR  OR  OR  O
OR  Q.2 a. Illustrate the general construction types of wing and fuselages. Explain its components.  b. Discuss the metallic and non-metallic materials used in aircraft applications with suitable examples.  Module – 2  Q.3 a. Derive an expression for speed of sound and discuss its significance.  b. With the help of neat sketches, explain, the following: i) Pressure distribution over a wing section ii) Air foil nomenclature.  OR  Q.4 a. Discuss the generation of Lift and Drag over an airfoil and write the equations for lift and drag components.  b. Define the following: i) Aerodynamic center ii) Aspect ratio iii) Center of pressure iv) Zero – lift condition.  c. A model wing air craft at a 4° angle of attacks with the normal and axial force 700 kN and 500 kN respectively. Calculate the lift and drag development in that aircraft flying at a velocity of 50m/s.  Module – 3  Q.5 a. List the classifications of aircraft power plants in detail. b. With the help of P-V and T-S diagram, explain the working of a Ramjet engine. List the advantages and disadvantages.  OR  Q.6 a. Illustrate a turbo fan engine and explain its working principle with the help of the P-V and T-S diagram.
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h.   Discuss the different methods of thrust augmentation in detail.   10   L2   CC
2
Module – 4
Q.7 a. With the help of proper sketches, explain the basic aircraft axis systems, 10 L2 CC
motions and control systems responsible for the same.
b. Describe the following:
i) Turning flight
ii) Gliding flight.
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	1	10	Т 2	CO
C 1 I was at bombs amala	decays	10	L2	CO.
Correct and In-correct bank angle	Car			
Inverted maneuvers.				
Module – 5				
aborate the importance of environment control system in an	aircraft.	10	L2	CO
plain the pneumatic systems and its applications in airplan	es.	10	L2	CO
OR				
th a neat sketch, explain the flight control system of an air	craft	10	L2	CO
scribe the Inertial Navigation system with the appropriate	sketches	10	L2	CO
scribe the inertial Navigation system with the appropriate	sketenes.	10		
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