

CBCS SCHEME

BAE302



USN

--	--	--	--	--	--	--	--	--	--

Third Semester B.E./B.Tech. Degree Examination, Dec.2023/Jan.2024

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			M	L	C
Q.1	a.	List the classification of Aircrafts and give examples.	6	L1	CO1
	b.	Illustrate the axis system of an aircraft and explain its corresponding motions.	8	L1	CO1
	c.	Explain the principle of operation of major components of Helicopter.	6	L1	CO1
OR					
Q.2	a.	Construct different types of fuselage structure and explain in detail.	10	L2	CO2
	b.	Compare the metallic and non-metallic materials used in aircrafts based on their properties.	10	L2	CO2
Module - 2					
Q.3	a.	Define the following : (i) TAS (ii) EAS (iii) CAS (iv) IAS (v) Ground speed	6	L2	CO2
	b.	Interpret the following Nomenclature of an airfoil: (i) NACA 6412 (ii) NACA 12018	8	L3	CO2
	c.	Draw the pressure distribution over a wing section and explain in detail.	6	L2	CO2
OR					
Q.4	a.	Define the following : (i) Center of pressure (ii) Aerodynamic center (iii) Aspect ratio (iv) Mach number (v) Zero-lift condition	10	L2	CO1
	b.	Define Drag. Explain the different types of drag acts on an aircraft.	10	L2	CO1
Module - 3					
Q.5	a.	Outline the classification of Aircraft power plants.	10	L2	CO2
	b.	Describe the operation of a RAM Jet Engine and explain its demerits and merits.	10	L2	CO2
OR					
Q.6	a.	With help of T-S and P-V diagram, explain the working of Brayton's cycle.	10	L2	CO2
	b.	Describe the various methods of Thrust Augmentation.	10	L2	CO2

Module – 4			
Q.7	a.	What are the four forces acting on an aircraft in flight? Explain the stability systems of an aircraft.	10 L2 CO3
	b.	Explain the following maneuvers : (i) Gliding (ii) Turning (iii) Pull up and Pull down	10 L3 CO3
OR			
Q.8	a.	Illustrate the power curves and discuss the performance characteristics of an aircraft.	10 L3 CO4
	b.	Describe the following : (i) Altitude performance of an aircraft. (ii) Correct and Incorrect banking.	10 L2 CO3
Module – 5			
Q.9	a.	Explain the pneumatic system used in aircraft with relevant sketches.	10 L2 CO3
	b.	Discuss the oxygen system application in an aircraft and explain its significance.	10 L2 CO3
OR			
Q.10		Write a note on:	20 L2 CO3
	a.	Communication and Navigation system.	
	b.	Cockpit Instrumentation and displays.	
