CBCS SCHEME

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BAE302

Third Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
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.	Briefly explain the classification of aircrafts.	6	L1	CO1
	b.	Name the basic components of an airplane with a neat diagram and explain function of each.	10	L2	CO1
	c.	Present short note on aircraft axis system.	4	L2	CO1
		OR			
Q.2	a.	With the help of neat sketch, explain monocoque, semi monocoque fuselage construction in detail.	10	L2	CO1
	b.	Discuss in detail about the developments in aircraft materials.	10	L1	CO1
		Module – 2			
Q.3	a.	Define with equation the speed of sound and explain its significance in aerodynamics.	10	L2	CO2
	b.	Discuss Bernoulli's theorem. Explain its significance for generation of lift and measuring airspeed.	10	L3	CO2
		OR			
Q.4	a.	Illustrate and explain the nomenclature of cambered air foil.	6	L2	CO2
	b.	List the different forces acting over an airplane and explain the factors affecting lift and drag.	8	L2	CO2
	c.	Define Mach Number and discuss different Mach number regimes.	6	L1	CO2
		Module – 3			
Q.5	a.	Describe the operation of a seramjet engine and write its merits and demerits.	10	L2	CO2
	b.	With help of T-S and P-V diagram, explain the working of Brayton's cycle.	10	L2	CO1
		OR			
Q.6	a.	Compare the merits and demerits of aircraft reciprocating engine, turbo prop, turbo fan and turbo jet engine.	12	L3	CO2
	b.	Describe the various methods of Thrust Augmentation.	8	L2	CO2

		Module – 4			
Q.7	**a.**	Define degrees of freedom for an aircraft and explain static and dynamic stability.	**10**	**L1**	**CO2**
	b.	Illustrate and explain the function of different types of control tabs.	**10**	**L1**	**CO2**
		OR			
Q.8	**a.**	Derive equation of motion for level un-accelerated flight.	**10**	**L3**	**CO2**
	b.	Briefly explain about correct and incorrect angles of bank aircraft.	**6**	**L2**	**CO2**
	c.	Write short note on inverted maneuvers.	**4**	**L1**	**CO2**
		Module – 5			
Q.9	**a.**	Describe the typical hydraulic system and its parts and functions with neat sketch.	**10**	**L2**	**CO2**
	b.	Construct the typical aircraft gravity feed fuel system and explain its functions.	**10**	**L3**	**CO3**
		OR			
Q.10	**a.**	Illustrate and explain the flight control system in detail.	**10**	**L2**	**CO2**
	b.	Explain the following : (i) Aircraft power generation systems. (ii) Aircraft Navigation system.	**10**	**L2**	**CO2**

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