CBCS SCHEME

USN 1 A Y 2 3 A E 0 1 0

BAE503

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Unmanned Aerial Vehicles – Basics and Applications

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.	Explain Generic UAV systems with a neat sketch.	10	L1	CO1
	b.	Define the following: i) Range ii) Reconnaissance iii) Surveillance iv) UAS v) Payload	10	L1	CO1
		OR			
Q.2	a.	List the classifications of UAV's based on their Classes, Mission, Range, Altitude and Size.	10	L1	CO1
	b.	Briefly explain any four UAV's developed in India with technical specifications.	10	L2	CO1
		Module – 2			
Q.3	a.	With help of neat sketches, explain the aircraft polar and write the basic aerodynamic equations.	10	L2	CO1
	b.	Explain the flapping wing aerodynamics with neat sketch.	10	L2	CO2
		OR			
Q.4	a.	Derive the Range and Endurance Equation for a propeller driven aircraft.	14	L3	CO2
	b.	Write a note on Gliding flight.	6	L2	CO2
		Module – 3			
Q.5	a.	Define Stability. Explain the longitudinal stability with the help of the sketches and equations.	10	L2	CO2
	b.	Illustrate the block diagram of flight control system and autopilot system and explain.	10	L2	CO2
		OR			
Q.6	a.	Write a note on: i) Flight Control Classification ii) Modes of operation	10	L2	CO2
	b.	Discuss the sensors supporting the autopilot system.	10	L2	CO2

		Module – 4			
Q.7	a.	Derive the equation for Thrust Generation and Powered Lift.	12	L2	CO3
	b.	List the sources of electric power. Explain the batteries used in UAV's.	8	L2	CO3
		OR			
Q.8	a.	With neat sketch, explain the Sandwich construction of composite panels used in UAV.	10	L2	CO3
	b.	Write a note on the following: i) V-n diagram ii) Loads acting on the airframe	10	L2	CO3
		Module – 5			
Q.9	a.	Draw the MPCS block diagram and explain in detail.	10	L2	CO2
	b.	Describe the elements of local area network and explain the different layers of OSI model.	10	L2	CO2
		OR			
Q.10	a.	Explain the desirable attributes for a UAV data link.	10	L2	CO3
	b.	Explain the design issues related to carriage and delivery systems in weapon payloads.	10	L3	CO3

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