U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: V**

Branch: Mechanical Engineering **Duration: 3 hrs.**

Course Code: 23ME5PEDUT / 22ME5PEDUT **Max Marks: 100**

Course: Drones and UAV Technology

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Discuss the DGCA classifications of UAVs. List and explain any five applications of UAV.	CO1	PO1	**10**
	b)	Explain the Anatomy of a Fixed Wing drone.	CO1	PO1	**10**
		OR			
2	a)	Discuss the difference between aircraft and UAV and List any five characteristics of Drones.	CO1	PO1	**10**
	b)	Explain the Anatomy of a Multi-rotor drone.	CO1	PO1	**10**
		UNIT - II			
3	a)	Explain the physical properties and structure of the atmosphere with the help of a sketch.	CO3	PO1	**10**
	b)	Explain the various types of aerodynamic forces acting on a fixed wing UAS.	CO3	PO1	**05**
	c)	Define and explain Angle of attack and Mach number	CO2	PO1	**05**
		OR			
4	a)	Illustrate the static longitudinal stability and dynamic stability of an UAV.	CO2	PO1	**10**
	b)	With the help of a sketch explain the aero foil nomenclature.	CO2	PO1	**05**
	c)	Discuss in brief pitch control and lateral control of an UAV.	CO2	PO1	**05**
		UNIT - III			
5	a)	Explain the working of Synthesis Aperture Radar (SAR).	CO4	PO1	**10**
	b)	Explain Active sensing and Passive sensing with examples.	CO4	PO1	**10**

			OR			
	6	a)	Illustrate the working of Light Detection and Ranging (LiDAR)	*CO4*	*PO2*	**10**
		b)	Explain the working of GPS.	*CO4*	*PO2*	**10**
			UNIT - IV			
	7	a)	Illustrate the working of Solar cells and Fuel cells in UAVs.	*CO6*	*PO2*	**10**
		b)	Show the working of gas turbine with the help of a sketch.	*CO6*	*PO2*	**10**
			OR			
	8	a)	Explain the various types of motors and batteries used in UAVs.	*CO3*	*PO2*	**10**
		b)	Show the working of Rotary engine (Wankel engine) with a sketch.	*CO3*	*PO2*	**10**
			UNIT - V			
	9	a)	Discuss the application of advanced geoprocessing and artificial intelligence to large volumes of drone data.	*CO3*	*PO5*	**10**
		b)	Explain the use of UAVs for habitat studies.	*CO5*	*PO6*	**10**
			OR			
	10	a)	List the various safety and privacy concerns in the use of UAVs.	*CO5*	*PO2*	**10**
		b)	Explain the use of UAVs for population assessment.	*CO5*	*PO6*	**10**

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