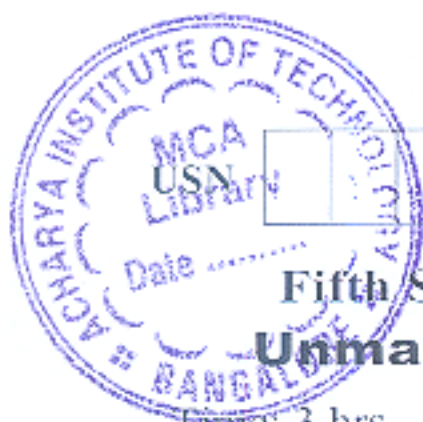




Fifth Semester B.E./B.Tech. Degree Examination, June/July 2025
Unmanned Aerial Vehicles – Basics and Applications

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.	How UAVs can be categorized based on altitude, range, mass and wing span?	10	L1	CO1
	b.	Brief the history of Aviation systems of UAV.	10	L1	CO1
OR					
Q.2	a.	State the functions of UAV.	6	L1	CO1
	b.	Describe the applications of UAV for civilian and military uses.	8	L2	CO1
	c.	Explain the following terms : i) HALE ii) Fixed wing UAVs.	6	L2	CO1
Module – 2					
Q.3	a.	Discuss the term aircraft polar and write its significance in aerodynamics.	8	L1	CO2
	b.	Prove that induced drag is proportional to lift co-efficient C_L and draw drag polar curve.	12	L3	CO2
OR					
Q.4	a.	Derive the Breguet's range and endurance equation for jet powered aircraft.	12	L3	CO2
	b.	Explain in detail, the effect of wind on UAV climb and descent performance.	8	L2	CO2
Module – 3					
Q.5	a.	Discuss about the static and dynamic stability.	4	L1	CO2
	b.	Describe how the longitudinal and lateral motion is achieved with respective controls.	8	L2	CO2
	c.	Explain the sensors supporting auto pilot system of an UAV.	8	L2	CO2
OR					
Q.6	a.	Explain the following : i) Adverse yaw ii) Asymmetric power.	8	L2	CO2
	b.	Draw a block diagram of flight control system and explain the components of auto pilot system of an UAV.	12	L3	CO2
Module – 4					
Q.7	a.	List the sources of electric power. Explain the batteries used in a typical UAV.	10	L2	CO3
	b.	Develop an equation for thrust generation for an UAV.	10	L3	CO3
OR					
Q.8	a.	Draw V-N diagram and describe the limits.	8	L2	CO3
	b.	Explain the manufacturing techniques used for developing composite material for an UAV.	8	L2	CO3
	c.	Discuss the use of resin materials in UAV construction.	4	L2	CO3
Module – 5					
Q.9	a.	Compare and briefly explain the different types of payloads.	10	L2	CO3
	b.	Explain the types of sensors are commonly used in reconnaissance and surveillance payloads.	10	L2	CO3
OR					
Q.10	a.	Briefly summarise the functions involved in data link systems in communication payloads.	10	L2	CO3
	b.	List the types UAV launchers, and write its merits and demerits.	10	L2	CO3
