Roll No.											

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 12-12-2025 **Time:** 01:00pm– 04:00pm

School: SOCSES	**Program:** B.Tech	
Course Code: MEC3074	**Course Name:** Autonomous Systems and Drones	
Semester: V	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Marks	**14**	**14**	**22**	**22**	**14**	**14**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	Define Autonomous Systems.	**2 Marks**	**L2**	**CO1**
2.	Write examples for mobile autonomous systems.	**2 Marks**	**L2**	**CO1**
3.	Define Roll and Pitch with respect to Drone operation.	**2 Marks**	**L2**	**CO2**
4.	Define IMU in Drone and write the function of it.	**2 Marks**	**L2**	**CO2**
5.	What is the function of brushless DC motor in Drone?	**2 Marks**	**L2**	**CO3**
6.	Define Thrust and write the thrust equation.	**2 Marks**	**L2**	**CO4**
7.	Write 3 selection criteria for the selection of materials used for drone airframe.	**2 Marks**	**L2**	**CO5**
8.	Define flight dynamics.	**2 Marks**	**L2**	**CO5**
9.	Define static and dynamic stability of drones.	**2 Marks**	**L2**	**CO6**
10.	Define drag and write the types of drag.	**2 Marks**	**L2**	**CO6**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Write the classification of Autonomous Systems based on different parameters.	**10 Marks**	**L3**	**CO1**
	b.	Write the differences between the Automated Systems and Autonomous Systems.	**10 Marks**	**L3**	**CO2**
		Or			
12.	**a.**	Write the applications of Autonomous Systems in various domains in detail.	**10 Marks**	**L3**	**CO1**
	b.	Write the historical background and current trend of autonomous systems in detail.	**10 Marks**	**L3**	**CO2**

13.	**a.**	Explain key regulations and guidelines with respect to drone usage at Global and National Level.	**10 Marks**	**L3**	**CO3**
	b.	Explain the various components used in drones along with their functions briefly.	**10 Marks**	**L3**	**CO3**
		Or			
14.	**a.**	Write the classification of drone systems based on various parameters.	**10 Marks**	**L3**	**CO3**
	b.	Write the historical background and current trend of drone systems in detail.	**10 Marks**	**L3**	**CO3**

15.	**a.**	List and explain the flight controller selection criteria and performance requirements of it along with feature matrix.	**10 Marks**	**L3**	**CO4**
	b.	List and explain the electronic speed controller (ESC) function and selection to be considered for the design and assembly of drone systems.	**10 Marks**	**L3**	**CO4**
		Or			
16.	**a.**	Explain the basic wiring fundamentals and best practices to be used in drone assembly. Also explain the basic soldering process.	**10 Marks**	**L3**	**CO4**
	b.	Explain the step-by-step process to be followed for assembly of drone components.	**10 Marks**	**L3**	**CO4**

17.	**a.**	What are all the forces acting on drone systems? And write definition for each of it. Also explain how each of these forces are generated during drone flying operation.	**10 Marks**	**L3**	**CO5**
	b.	What is flight controller? Explain it along with it’s key components and what parameters are to be considered to select a flight controller?	**10 Marks**	**L3**	**CO6**
		Or			
18.	**a.**	Explain the flight dynamics and stability concept with respect to drones in detail by considering the relevant diagrams.	**10 Marks**	**L3**	**CO5**
	b.	Explain the flight performance and efficiency. Also explain the parameters affecting the flight performance and efficiency.	**10 Marks**	**L3**	**CO6**