

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code: 3160114****Date: 12-07-2023****Subject Name: Introduction to UAV****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		<b>MARKS</b>
<b>Q.1</b>	(a) What are UAVs? Give two applications of UAVs.	<b>03</b>
	(b) Differentiate Drones and UAVs.	<b>04</b>
	(c) Discuss the important parameters involved in 'Selection of Systems' for UAVs.	<b>07</b>
<b>Q.2</b>	(a) How do you calculate the lift induced drag for fixed wing aircraft? Mention the variables involved.	<b>03</b>
	(b) How the payload and the air vehicle affects the UAVs?	<b>04</b>
	(c) Discuss in detail the UAV Launch Methods for Fixed-Wing Vehicles.	<b>07</b>
	<b>OR</b>	
	(c) Write short note on launch and recovery equipment for UAVs as a part of UAVs system functional structure.	<b>07</b>
<b>Q.3</b>	(a) Why should environmental conditions to be considered during the selection of UAV system?	<b>03</b>
	(b) What are different roles where UAVs can perform better than manned aircrafts, discuss anyone in detail?	<b>04</b>
	(c) Discuss the preliminary design and detailed design phases of UAVs.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) How do you calculate $V_{min}$ for a UAV with flaps?	<b>03</b>
	(b) Write short notes on 'payload consideration' for design of UAVs.	<b>04</b>
	(c) Write short notes on 'Navigation' systems for UAVs.	<b>07</b>
<b>Q.4</b>	(a) How the UAV is guided?	<b>03</b>
	(b) Explain the utility of thermal cameras and ultrasonic detectors in UAV system.	<b>04</b>
	(c) Write short notes on 'Communication' systems for UAVs.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Brief about the different types of UAV payloads.	<b>03</b>
	(b) Explain the manual control system of UAVs.	<b>04</b>
	(c) Which are the different forms of airframes of UAVs.	<b>07</b>
<b>Q.5</b>	(a) Which are the different components of UAV?	<b>03</b>
	(b) Discuss the Dijkstra's Algorithm for UAV guidance.	<b>04</b>
	(c) What kind of different sensors are used to measure the height of UAV? Discuss them briefly.	<b>07</b>
	<b>OR</b>	
<b>Q.5</b>	(a) What is meant telemetry?	<b>03</b>
	(b) Explain the Catapult Launch System Tests for UAVs.	<b>04</b>
	(c) In detail, explain the process of UAV testing.	<b>07</b>

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