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**BTECH**  
**(SEM VIII) THEORY EXAMINATION 2024-25**  
**FUNDAMENTALS OF DRONE TECHNOLOGY**

TIME: 3 HRS

M.MARKS: 100

**Note:** Attempt all Sections. In case of any missing data; choose suitably.

**SECTION A**

**1. Attempt all questions in brief.**

**2 x 10 = 20**

| Q No. | Question   | CO | Level |
|-------|--|----|-------|
| a.    | What are the main categories of Unmanned Aerial Vehicles (UAVs)? | 1  | K2    |
| b.    | Define aerodynamic drag and explain its relevance to UAV design. | 1  | K2    |
| c.    | List the key components of a drone's avionics system.            | 2  | K2    |
| d.    | What is the function of the autopilot in a drone?                | 2  | K2    |
| e.    | Explain the term 'PID control' in the context of UAVs.           | 3  | K2    |
| f.    | What are telemetry systems and why are they important?           | 3  | K2    |
| g.    | Define waypoints navigation with an example.                     | 4  | K2    |
| h.    | What are the challenges in in-flight testing of drones?          | 4  | K2    |
| i.    | Mention two stealth design strategies used in UAVs.              | 1  | K2    |
| j.    | What are the regulatory aspects for drones in India?             | 1  | K2    |

**SECTION B**

**2. Attempt any three of the following:**

**10 x 3 = 30**

| Q No. | Question   | CO | Level |
|-------|--|----|-------|
| a     | Describe the classification and applications of UAVs.                              | 1  | K2    |
| b     | Discuss different airframe configurations and their effects on drone performance.  | 1  | K3    |
| c     | Explain the integration and configuration process of drone avionics systems.       | 2  | K3    |
| d     | Describe the various communication systems used in drones and their functionality. | 3  | K3    |
| e     | Highlight future prospects and key challenges in drone navigation and testing.     | 4  | K3    |

**SECTION C**

**3. Attempt any one part of the following:**

**10 x 1 = 10**

| Q No. | Question  | CO | Level |
|-------|---|----|-------|
| a     | Explain the history and evolution of UAV drones with specific technological milestones. | 1  | K3    |
| b     | Discuss Indian drone regulations and their impact on design standards.                  | 1  | K3    |

**4. Attempt any one part of the following:**

**10 x 1 = 10**

| Q No. | Question   | CO | Level |
|-------|--|----|-------|
| a     | Describe the key features and roles of the processor and servos in drone avionics. | 2  | K3    |



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**M.MARKS: 100**

|   |  |   |    |
|---|--|---|----|
| b | Discuss how gyroscopes and accelerometers help maintain drone stability. | 2 | K3 |
|---|--|---|----|

**5. Attempt any one part of the following: 10 x 1 = 10**

| Q No. | Question  | CO | Level |
|-------|---|----|-------|
| a     | Elaborate the PID feedback control system used in UAVs.                           | 3  | K4    |
| b     | Explain payload and telemetry systems with real-world drone application examples. | 3  | K4    |

**6. Attempt any one part of the following: 10 x 1 = 10**

| Q No. | Question  | CO | Level |
|-------|---|----|-------|
| a     | Explain how ground control software assists in drone navigation and monitoring. | 4  | K4    |
| b     | Discuss the procedures and significance of in-flight drone testing.             | 4  | K4    |

**7. Attempt any one part of the following: 10 x 1 = 10**

| Q No. | Question   | CO | Level |
|-------|--|----|-------|
| a     | Design a conceptual UAV drone system for agricultural surveillance, covering components and functions. | 1  | K6    |
| b     | Propose a UAV system with stealth capabilities and justify the design choices.                         | 1  | K6    |