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Question Paper Code: U7306

B.E. / B.Tech. DEGREE EXAMINATION, APRIL/MAY 2025

Professional Elective

Mechanical Engineering

21MEV306 – DRONE TECHNOLOGIES

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. What does UAV stand for? CO1- U
(a) Unmanned Aerial Vehicle (b) Universal Aviation Vehicle
(c) Unidentified Airborne Vehicle (d) Unmanned Automated Vehicle
2. Which programming language is widely used for drone programming? CO1- U
(a) Python (b) HTML (c) CSS (d) SQL
3. What is the function of Electronic Speed Controllers (ESCs) in a drone? CO1- U
(a) Control the power supplied to motors (b) Increase drone speed
(c) Store flight data (d) Improve video transmission
4. What is the role of a drone's flight controller? CO1- U
(a) Manages motor speed and stability (b) Increases battery life
(c) Controls camera movement (d) Stores GPS data
5. Which sensor is commonly used in drones for altitude measurement? CO1- U
(a) Temperature sensor (b) Barometer (c) Light sensor (d) Microphone
6. What is the purpose of obstacle detection sensors in drones? CO1- U
(a) To increase flight speed (b) To prevent collisions during flight
(c) To reduce battery consumption (d) To improve video quality

7. How are drones used in the insurance sector? CO1- U
 (a) Inspecting damaged properties for claims (b) Delivering insurance policies
 (c) Conducting customer surveys (d) Managing financial transactions
8. Which sensor is commonly used in drones for mapping and surveying applications? CO1- U
 (a) LiDAR (b) Microphone (c) Temperature sensor (d) Altimeter
9. Why is it important to follow aviation regulations when flying drones? CO1- U
 (a) To ensure safe operations and avoid legal issues (b) To increase the drone's battery life
 (c) To improve drone camera resolution (d) To reduce the number of propellers
10. Which technological advancement is improving drone autonomy? CO1- U
 (a) Artificial Intelligence (AI) and machine learning
 (b) Increasing drone weight
 (c) Reducing the number of sensors
 (d) Removing GPS functionality

PART – B (5 x 2= 10 Marks)

11. What is a barometer and how is it used in drones? CO1- U
12. Define the terms (i) Pitch (ii) Roll (iii) Yaw (iv) Throttle. CO1- U
13. What is the function of ultrasonic sensors in drones? CO1- U
14. List a few applications of drones. CO1- U
15. What is the need for miniaturization of drones? CO1- U

PART – C (5 x 16= 80 Marks)

16. (a) Discuss the classification of UAVs based on size, function, and operational characteristics. CO1- U (16)
 Or
 (b) Describe the different types of drones based on their design and applications with suitable examples. CO1- U (16)
17. (a) Describe the methods used in drone programming and how different software tools help in automation. CO1- U (16)
 Or
 (b) Explain in detail the different types of drone configurations and their advantages and disadvantages. CO1- U (16)

18. (a) Identify the role of sensors in drones and explain the functions of ultrasonic sensors, barometers, and magnetometers. CO3- App (16)
- Or
- (b) Identify the mobile devices and applications enhance drone operation and data management. CO3- App (16)
19. (a) Identify the role of drones in inspecting transmission lines and power distribution systems and their benefits. CO4- App (16)
- Or
- (b) Identify the applications of drones in agriculture sector and explain in detail. CO4- App (16)
20. (a) Identify and explain how drone swarms can be applied in disaster management for search-and-rescue operations. CO2- App (16)
- Or
- (b) Make use of AI and machine learning how enhance the autonomy of drones in real-world applications. CO2- App (16)

