

CBCS SCHEME

15AE661

USN

Date

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Unmanned Aerial Vehicles and Its Application

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With respect to timeline briefly explain the history of development of UAV. (08 Marks)
b. Briefly explain any four UAV's developed in India with technical specification. (08 Marks)

OR

- 2 a. Discuss in detail about classification of UAV's based on their classes and mission. (10 Marks)
b. Define the terminologies.
i) Range ii) Endurance iii) Payload iv) Reconnaissance v) Surveillance. (06 Marks)

Module-2

- 3 a. Derive the range and Endurance for a jet driven aircraft. (12 Marks)
b. Explain aircraft polar. (04 Marks)

OR

- 4 a. Explain the flapping on wing aerodynamics. (06 Marks)
b. Explain climbing and guiding flight. (06 Marks)
c. Define : i) Induced drag ii) Upwash and Downwash. (04 Marks)

Module-3

- 5 a. What is autopilot system? Explain any one system in detail. (08 Marks)
b. Explain the sensors supporting the autopilot system. (08 Marks)

OR

- 6 a. Define stability. Briefly explain : i) Longitudinal stability ii) Lateral stability
iii) Dynamic stability. (10 Marks)
b. Explain the flight control classification. (06 Marks)

Module-4

- 7 a. Explain the basic working principle of i) Rotary engine ii) Gas turbine engine. (10 Marks)
b. Derive the equation for thrust generated. (06 Marks)

OR

- 8 a. What are the loads acts on the UAV and list out the materials used in the construction UAV. (08 Marks)
b. With neat sketch, explain the sandwich construction of a panel used in UAV. (04 Marks)
c. What are sources of electrical power in UAV. (04 Marks)

Module-5

- 9 a. Explain MPCS with block diagram. (08 Marks)
b. Classify the possible payloads of UAV and explain. (08 Marks)

OR

- 10 a. Explain the functions of data-link and desirable data-Link attributes. (08 Marks)
b. Explain the design issues related to carriage and delivery systems. (04 Marks)
c. Explain : i) Launch methods for UAV ii) Recovery systems for UAV. (04 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.