Hall Ticket No | | | | | | | | | | | Question Paper Code: AAEB32

INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech V Semester End Examinations (Regular), February – 2021

Regulation: IARE–R18

UNMANNED AIR VEHICLES

Time: 3 Hours **(AE)** **Max Marks: 70**

Answer any Four Questions from Part A
Answer any Five Questions from Part B

PART – A

1. Describe the catapult launching system of an UAV. **[5M]**
2. Explain the components of the lift induced drag? How do they affect lift induced drag? **[5M]**
3. Explain the characteristics of fixed wing UAV. **[5M]**
4. Describe the functions of ground control station with a neat sketch. **[5M]**
5. For what kind of roles data transmission by fibre-optics is suitable option? **[5M]**
6. Explain how payload is influenced in design consideration. **[5M]**
7. Describe the drag forces acting on fixed wing UAV with a neat sketch. **[5M]**
8. Explain the importance of maintenance of the communications in UAS operations? **[5M]**

PART – B

9. Illustrate the functional structure of UAV system and discuss the control station and payload. **[10M]**
10. Differentiate various configurations of fixed wing of an UAV's. Describe the conceptual phase of design of UAS. **[10M]**
11. Compare 'Ducted Fan Aircraft' and 'Jet-life Aircraft' airframe configurations. **[10M]**
12. Identify the main causes for an aircraft to have a high response to atmospheric turbulence and explain the possible methods to reduce it. **[10M]**
13. Describe the HALE and MALE types of flight vehicles with suitable examples. **[10M]**
14. Write a short note on classification of UAV based up on altitude, weight, endurance. **[10M]**
15. Classify the three main concerns of the Long-endurance, Long-range Role UAV designer, discuss in detail with the necessary diagram? **[10M]**
16. Describe the different navigation systems for UAVs. Identify the need for Nano air vehicle systems? Explain the developments of NAVs. **[10M]**
17. Identify the relation between communication range and height of operating UAV, discuss with the help of necessary diagram? **[10M]**
18. Identify the challenges in achieving the control and stability for SMR helicopter, and explain the AFCS for SMR helicopter with necessary diagrams and examples. **[10M]**