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Question Paper Code: AAE001



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech III Semester End Examinations (Supplementary) - January/February, 2018

Regulation: IARE – R16

## INTRODUCTION TO AEROSPACE ENGINEERING

(Aeronautical Engineering)

Time: 3 Hours

Max Marks: 70

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Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

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### UNIT – I

1. (a) Explain any two types of flight vehicles. [7M]  
(b) Differentiate between jet aircrafts and helicopters with respect to flying principle. [7M]
2. (a) Explain the environmental impact on a spacecraft. [7M]  
(b) Write notes on the following. [7M]
  - i. Temperature extremes of space
  - ii. Commercial use of space

### UNIT – II

3. (a) Explain the terms:  
i) Lift ii) Drag iii) Thrust [7M]  
(b) Discuss in detail about drag polar curve? How will lift influence drag, explain with help of drag polar curve. [7M]
4. (a) What is the significance of mach number and how it is related to the compressibility of the air? [7M]  
(b) Discuss the different types of aerodynamic forces acting on a wing. [7M]

### UNIT – III

5. (a) Explain the different types of performance parameters of a flight. [7M]  
(b) Write a short note on stalling speed of an aircraft that is in steady and level flight. [7M]
6. (a) Discuss in detail about VTOL, STOL. [7M]  
(b) Explain swept back wing and its contribution on directional stability. [7M]

#### UNIT – IV

7. (a) Describe the advantages and disadvantages using composite materials for aircraft structures. [7M]  
(b) State the uses of titanium and its alloys in aircraft industry. [7M]
8. (a) Explain the principle of operations of rocket. [7M]  
(b) Describe the general considerations for the fuselage design of an airplane and desired material properties . [7M]

#### UNIT – V

9. (a) Write a short note on power systems employed in the design of satellite launch vehicle. [7M]  
(b) Write the goals of human space flight missions. [7M]
10. (a) Discuss in detail about the contribution of our country in aviation, missile and space technology. [7M]  
(b) Explain the need for insulating and plating the satellite components. [7M]

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