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Question Paper Code: 1103044
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B.E. / B.Tech. DEGREE EXAMINATIONS, NOV/ DEC 2024

Third Semester

Aerospace Engineering

U20AS303 – ELEMENTS OF SPACEFLIGHT

(Regulation 2020)

Time: Three Hours

Maximum: 100 Marks

Answer ALL questions

PART – A

(10 x 2 = 20 Marks)

1. Define Biplanes.
2. List the key developments in flight structures over the years.
3. Explain the significance of temperature and pressure in flight dynamics.
4. Define lift.
5. Define the term "design for launch" in spacecraft engineering.
6. Name two key considerations in the configuration of spacecraft structures.
7. Explain the working principle of air breathing engines.
8. List the types of rockets commonly used in aerospace applications.
9. Define "orbital mechanics".
10. Define reference coordinate system in space.

PART – B

(5 x 16 = 80 Marks )

11. (a) Classify Flight Vehicles and explain the evolution of different types of flight vehicles with examples. (16)

(OR)

- (b) Explain the developments in aerodynamics, propulsion, materials, and structures that have improved aircraft and spacecraft performance over the years. (16)

12. (a) Explain the physical properties and structure of atmosphere in detail. (16)

(OR)

- (b) Explain the relationship between temperature, pressure, and altitude, and describe how these atmospheric properties affect aircraft performance. (16)

13. (a) Explain the design philosophy for spacecraft structures. (16)

(OR)

- (b) Explain the future challenges and opportunities for space structure design. (16)

14. (a) Explain the principle of operation of a turbo jet engine with a neat sketch. (16)

(OR)

- (b) Explain the principle of operation of a Solid Propellant rocket engine with a neat sketch. (16)

15. (a) Explain the different types of satellites launched by various countries and their applications. (16)

(OR)

- (b) Explain the Fundamental Concepts of Astronomy and describe their Impact on Our Understanding of the Universe. (16)