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Question Paper Code : 40050

B.E. /B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Third Semester

Aeronautical Engineering

AE8302 – ELEMENTS OF AERONAUTICAL ENGINEERING

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Differentiate Biplanes and Monoplanes.
2. Name few advanced materials used for aircraft manufacturing.
3. Name the major components of an airplane.
4. Differentiate conventional control and powered control.
5. Define Mach Number
6. Define ISA and explain its significance?
7. Differentiate Air breathing and Rocket propulsion.
8. What are the parts of a jet engine?
9. Differentiate Monocoque and Semi-monocoque fuselage structures.
10. Define Fail safe design.

PART B — (5 × 13 = 65 marks)

11. (a) Describe the history of development of aircraft in detail.

Or

- (b) Explain the development of airplane propulsion systems over the years.

12. (a) Describe about the basic instruments required for flying.

Or

- (b) Explain the classifications of Flight Vehicles in detail.

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

Or

- (b) Briefly describe Temperature, pressure and altitude relationships.

14. (a) With neat sketch explain the typical liquid propellant rocket engine and describe the advantages of liquid propellant rockets over solid propellant rockets.

Or

- (b) Explain the working principle of a Turbo jet engine with a neat sketch.

15. (a) Explain typical wing and fuselage structure in detail

Or

- (b) Describe the terms proportional limit, yield stress and ultimate tensile stress from a general stress-strain diagram.

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PART C — (1 × 15 = 15 marks)

16. (a) Analyze various materials used for aircraft construction and describe the role of composite materials and Titanium alloys towards the emerging developments.

Or

- (b) Analyze various propulsion systems used for rockets and describe the current developments in propulsion system for space exploration.
