Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 52524

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Third Semester

Aeronautical Engineering

AE 6302 — ELEMENTS OF AERONAUTICS

(Regulation 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Differentiate Biplanes and Monoplanes.
2. Who and when did he, drew the first heavier than air engine powered airplane?
3. Write the values of T, P and ρ at sea level conditions as stated by ISA.
4. Classify the Mach regimes.
5. Why do you need a dorsal fin?
6. Mention the types of flight control systems.
7. Define Hooke's law.
8. Discuss shortly the importance of using high temperature materials in the airplane.
9. Classify aircraft power plant.
10. What is TSFC?

PART B — (5 × 13 = 65 marks)

11. (a) Discuss briefly the timeline advancements in the heavier than air engine powered controlled airplanes and their applications. (13)

Or

(b) (i) Write short notes on "Hot air balloons". (7)

(ii) Comment shortly on "Ornithopters". (6)

12. (a) (i) Discuss in detail about the structure of the atmosphere. (8)

(ii) Give details about the types of altitudes. (5)

Or

(b) Explain the level turn maneuver and pull up maneuver with diagrams. (13)

13. (a) Explain the classification or flight vehicles in detail. (13)

Or

(b) Discuss the basic hydraulic system with 'Power driven Pump'. (13)

14. (a) Brief the monocoque and semi-monocoque Constructions. (13)

Or

(b) List and discuss the commonly used metallic, non-metallic and composite materials used in the construction of airplane structures. (13)

15. (a) Explain the construction and working of a Turboprop engine. (13)

Or

(b) Write in detail the principle of operation of rocket, along with its types and applications. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Draw the top view of a conventional airplane, mention its components and explain their functions. (15)

Or

(b) Derive the temperature, pressure and altitude relationships in gradient and isothermal layers or International standard atmosphere. (15)

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