



CBCS SCHEME

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17AE45

Fourth Semester B.E. Degree Examination, Dec.2023/Jan.2024

Aircraft Material Science

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What are the requirements of aircraft materials? (10 Marks)
b. List the different NDT techniques to inspect aircraft materials, briefly elucidate any two. (10 Marks)

OR

- 2 a. Elucidate the selection process of materials for the use in aircraft. (10 Marks)
b. Draw and label the aircraft, also list and explain the materials used for respective components. (10 Marks)

Module-2

- 3 a. What are the properties of magnesium and its alloy? Discuss briefly. (10 Marks)
b. What is heat treatment process? List and explain all the processes. (10 Marks)

OR

- 4 a. Elucidate the chemical composition and microstructure of nickel based super alloys. (10 Marks)
b. With a neat flow chart explain the manufacturing process of super alloys. (10 Marks)

Module-3

- 5 a. Define and classify the polymers. (08 Marks)
b. What are the roles of advanced ceramics in aerospace industry? Elucidate briefly any two ceramic materials. (12 Marks)

OR

- 6 a. What are the properties of plastics? Explain briefly. (10 Marks)
b. Define composites. What are the properties and applications of Metal Matrix Composites (MMC's). (10 Marks)

Module-4

- 7 a. How the ablator materials acts as heat shield? Give classification for ablators. (10 Marks)
b. How the wing and fuselage covering process done? What are the advantages? (10 Marks)

OR

- 8 a. What are the steps involved in aircraft painting process? Explain the need of painting. (10 Marks)
b. What is doping? How the doping helps in covering process. (10 Marks)

Module-5

- 9 a. What are the materials used for rockets and missiles? Elucidate briefly. (10 Marks)
b. What are the mechanical characteristics of solid propellant? (10 Marks)

OR

- 10 a. How the cryogenic insulation process done? And what are the materials used for it. (10 Marks)
b. With a help of neat sketch explain the liquid propellant. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.