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Fourth Semester B.E. Degree Examination, June/July 2023 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. List the different types of testing methods of aircraft material and explain briefly. (10 Marks)
b. Explain briefly about the use of,
(i) Aluminium alloys
(ii) Magnesium alloys
(iii) Titanium alloys
(iv) Corrosion and Heat Resistant steels. (10 Marks)

OR

- 2 a. Explain in detail selection of materials for use in aircraft and mention different inspection methods used in Aircraft materials. (10 Marks)
b. Explain plain carbon, low carbon steels and surface treatments for different alloys used in Aircrafts. (10 Marks)

Module-2

- 3 a. Describe briefly Nickel based super alloys and its micro structure. (10 Marks)
b. Write the application of super alloys. (10 Marks)

OR

- 4 a. Explain the following fabrication processes of carbon- carbon composites and ceramic matrix composites. (10 Marks)
b. Write properties and applications of metal matrix and polymer matrix composite. (10 Marks)

Module-3

- 5 a. Classify polymer material and explain them briefly. (10 Marks)
b. Explain plastics and its categories with properties and applications. (10 Marks)

OR

- 6 a. Explain commonly used glass and transparent plastics in aircraft with their properties and applications. (10 Marks)
b. Explain different adhesives and sealants used in Aircraft with their applications. (10 Marks)

Module-4

- 7 a. Explain about ablation process and write application of ablative materials in aerospace. (10 Marks)
b. Explain different woods used in Aircraft with properties and applications. (10 Marks)

OR

- 8 a. Explain different type of Aircraft paints with purpose and painting effects on materials. (10 Marks)
b. Define terminologies pertaining to aircraft fabric S and their applications. (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.

Module-5

- 9 a. Write the different corrosion protective technique and explain them briefly. (10 Marks)
b. Explain different materials used for Rockets and Missiles stating these properties and applications. (10 Marks)

OR

- 10 a. Explain the different corrosion removal methods commonly used in aircrafts metals. (10 Marks)
b. Explain mechanical characterization of solid propellants using uni-axial, strip-biaxial and tubular tests. (10 Marks)
