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18AE45

Fourth Semester B.E. Degree Examination, July/August 2022
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. Name different types of testing methods of aircraft materials and explain briefly. (10 Marks)
b. State the selection criteria based on properties for material used in aircraft. (10 Marks)

OR

- 2 a. Explain the application and trends in usage of materials in aero engines. (10 Marks)
b. Discuss the importance and application of Titanium alloys in aircraft structure. (10 Marks)

Module-2

- 3 a. Discuss briefly about the surface treatment given to super alloys. (10 Marks)
b. Describe briefly about Nickel based super alloys and its microstructures. (10 Marks)

OR

- 4 a. Write the properties and applications of Carbon – Carbon composites. (10 Marks)
b. Write short notes on :
i) Intermetallic Matrix Composites based on polymer
ii) Ablative Composites based on polymer. (10 Marks)

Module-3

- 5 a. Briefly explain the characteristics of typical applications of plastic materials. (12 Marks)
b. Define adhesive and sealant. State their applications in aircraft. (08 Marks)

OR

- 6 a. Write the types of non Scatterable glass available and explain briefly. (10 Marks)
b. Briefly explain the typical properties and polymer materials. (10 Marks)

Module-4

- 7 a. Define Ablation process. What are the different ablative materials and their applications in aerospace? (10 Marks)
b. Describe the classification and properties of wood. (10 Marks)

OR

- 8 a. Describe briefly about aircraft painting process. (10 Marks)
b. What is the purpose of painting an aircraft? State the different types of aircraft paints. (10 Marks)

Module-5

- 9 a. List out the materials used for Rockets and Missiles and explain its properties. (10 Marks)
b. What are the different methods employed in removal of corrosion from common aircraft metals. (10 Marks)

OR

- 10 a. Write a short note on insulating materials used for cryogenic engines of aircraft. (10 Marks)
b. Explain the following: i) Uniaxial testing ii) Strip-bioaxial. (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.