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15AE45

Fourth Semester B.E. Degree Examination, July/August 2022
Aircraft Material Science

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Define the following :
i) Normalizing ii) Quenching iii) Carburizing iv) Case hardening. (04 Marks)
b. Describe how yield point of a material can be determined. (06 Marks)
c. Explain the methods that are commonly used to detect minute surface. (06 Marks)

OR

- 2 a. Describe IADS with example. (08 Marks)
b. Illustrate a 3 – D phase diagram for classification of Ti – alloys. (08 Marks)

Module-2

- 3 a. Explain CMM. (06 Marks)
b. Describe 3 types of matrices produce 3 common types of composites. (10 Marks)

OR

- 4 a. What is super alloy? Discuss briefly Nickel based super alloys. (10 Marks)
b. Discuss the growth of composite usage in aircraft structures. (06 Marks)

Module-3

- 5 a. Define adhesives and sealants. Give their application in aircraft. (10 Marks)
b. Give the typical mechanical and physical properties of aircraft quality glass. (06 Marks)

OR

- 6 a. Write a short note on the following: i) Thermoplastic ii) Thermo setting plastic. (06 Marks)
b. Explain the characteristics and applications of commonly used polymer materials. (10 Marks)

Module-4

- 7 a. Explain the working of Ablator with neat diagram. (10 Marks)
b. Why do we need high fidelity models? (06 Marks)

OR

- 8 a. List various types of Aircraft wood and describe their properties and applications. (08 Marks)
b. Explain the purpose of Doping and commonly used Dopes. (08 Marks)

Module-5

- 9 a. Describe the following :
i) Chrome – pickle treatment ii) Sealed chrome – pickle treatment (06 Marks)
b. Explain the operation of anodizing process. (10 Marks)

OR

- 10 a. List the materials used for rocket and missiles. Explain the desirable properties. (10 Marks)
b. Describe the following: i) Strip – biaxial ii) Tubular test. (06 Marks)

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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.