

CBCS SCHEME

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Fourth Semester B.E. Degree Examination, Dec.2019/Jan.2020

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. Briefly explain the material application and trends in usage in aircraft structure and engine with for the same. (10 Marks)
- b. Define the following:
(i) Normalizing (ii) Quenching (iii) Hardening (iv) Case hardening (04 Marks)
- c. Describe how yield point of a material can be determined. (06 Marks)

OR

- 2 a. Write a note on Ti alloy. (03 Marks)
- b. Name some of the factors that are considered in the selection of material for airframe. (10 Marks)
- c. Explain surface treatment aspects to the alloys. (07 Marks)

Module-2

- 3 a. What are super alloys? Write a note on Nickel based super alloy. (10 Marks)
- b. Describe three types of matrixes produce in three common types of composites. (10 Marks)

OR

- 4 a. Define composite. List advantages and disadvantages of composite over conventional alloys. (10 Marks)
- b. With neat sketch, explain Filament winding process and list advantages and disadvantages. (10 Marks)

Module-3

- 5 a. Briefly explain the characteristics and typical applications of plastic materials. (08 Marks)
- b. Write a note on the following: (i) Thermoplastic (ii) Thermo setting plastic (08 Marks)
- c. Write a note on: Shatter proof glass. (04 Marks)

OR

- 6 a. Define adhesive and sealants. Give their application in aircraft. (10 Marks)
- b. Define ceramic materials. How they are classified? Briefly explain the characteristics of ceramics. (10 Marks)

Module-4

- 7 a. What is seasoning of wood and plywood? Explain the defects in wood. (10 Marks)
- b. Classify ablative materials and list advantages and disadvantages. (10 Marks)

OR

- 8 a. Name the different types of aircraft paints. Explain the purpose of painting. (10 Marks)
- b. Explain the purpose of doping and commonly used dopes. (10 Marks)

Module-5

- 9 a. Explain the operation of alodizing process. (10 Marks)
- b. Explain surface treatment for magnesium alloy parts to prevent corrosion. (10 Marks)

OR

- 10 a. List and explain different materials used for rockets and missiles applications. (10 Marks)
- b. List and explain the desirable property of solid propellants. (10 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.