USN

21AE32

Third Semester B.E. Degree Examination, June/July 2023
Aircraft Materials and Processes

Time: 3 hrs.

Max. Marks: 100

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

Module-1

1 a. Write the mechanical properties of aerospace materials and brief about it. **(10 Marks)**
   b. With a neat sketch explain stress-strain curve for mild steel and explain the salient points. **(10 Marks)**

OR

2 a. Describe the inspection methods used for aircraft materials. **(10 Marks)**
   b. List and explain any two types of testing used for aircraft materials. **(10 Marks)**

Module-2

3 a. Discuss the types of alluminium alloys with applications in the aero-industry. **(10 Marks)**
   b. List the application of magnesium alloys and titanium alloys in aircraft industry. **(10 Marks)**

OR

4 a. Elaborate the different types of heat treatment process for alluminium. **(10 Marks)**
   b. Identify different non-metals used in aircrafts explain any two in details. **(10 Marks)**

Module-3

5 a. Discuss in detail plain carbon steel and low carbon steel. **(10 Marks)**
   b. Explain the production and manufacturing methods for corrosion resistant and managing steels. **(10 Marks)**

OR

6 a. Describe the production methods and application of Nickel based alloys in aircraft industry. **(10 Marks)**
   b. Explain the welding process used for super alloys. **(10 Marks)**

Module-4

7 a. List physical characteristics of commonly used ceramic, properties and application of ceramics. **(10 Marks)**
   b. Write a note on glass and its shaping methods with neat sketch. **(10 Marks)**

OR

8 a. Discuss the following:
   i)   Polymer matrix composite
   ii) Metal matrix composite. **(10 Marks)**
   b. Draw neat sketch and explain
   i) Stir casting   ii) Squeeze casting. **(10 Marks)**

Module-5

9 a. Define corrosion and how to detect and prevention of corrosion explain. **(10 Marks)**

   b. Discuss the following:
   i)   Inspection of parts by hot oil and chalk.
   ii) Fluorescent and magnetic particles. **(10 Marks)**

OR

10 a. Describe the X-ray and ultrasonic inspection method. **(10 Marks)**

    b. Differentiate destructive and non-destructive testing technique. **(10 Marks)**

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