

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Winter 2022 - 23 Examination

Semester: 3
Subject Code: 203101207
Subject Name: Aircraft Material & Processes

Date: 18/10/2022
Time: 2:00pm to 4:30pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (All are compulsory) (Each of one mark) (15)

1. Which of the following is not a property of aluminium that makes it ideal to use as an aircraft material?

a) Resistance to corrosion	b) Light in weight
c) High fuel consumption	d) High strength alloy
2. What is the effect of heat treatment on a metal?

a) Improvement in availability	b) Improved physical properties
c) Decreased color	d) Decreased availability
3. Quenching involves submerging a heated metal in a liquid to speed up its cooling process.

a) True	b) False
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4. Which of the following is an economic consideration of a material?

a) Structure	b) Appearance
c) Availability	d) Strain
5. Which of the following is a technological factor of materials?

a) Castability	b) Melting point
c) Availability	d) Stress
6. During tension testing, the material must be held in _____ alignment.
7. In the tension testing experiment, while determining elastic limit, the increment, while the load is being increased, should not exceed _____ % of the elastic limit in the ending.
8. Steel has _____ strength to weight ratio.
9. Steel has a _____ fatigue life in comparison to other metals like aluminium.
10. Materials with _____ are typically used in aircraft construction.
11. What is fatigue strength?
12. What does a good working property of material mean?
13. Why is the reliability of a material an important property?
14. What is the foamability of a material?
15. Is the standardization of materials advantageous?

Q.2 Answer the following questions. (Attempt any three) (15)

- A) Explain Electromagnetic induction principle.
- B) What is the disadvantage of liquid penetrant test? And also Substitute the reasons why it is?
- C) Explain resistance welding process.
- D) How can slag inclusions in welding be avoided?

Q.3 A) Which Factors that affect an Alloy's heat resistance? Explain in details. (07)

- B) Why Manufacture of honeycomb structures differ than other structures in Aircraft? Explain in brief. (08)

OR

- B) What are the properties and applications of glass fibers, carbon fibers and metal fibers? (08)

Q.4 A) Describe the Response of a Viscoelastic material in the Tension test with the help of loading (07)

And unloading with possible permanent deformation diagram.

OR

- A) Explain Acid refractories, Basic refractories and Neutral refractories materials. (07)

- B) What are the benefits of Hydroforming? And Is Hydroforming Affordable? (08)