

# CBCS SCHEME

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18AS36

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

## Aerospace Materials

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Explain Strain hardening, with a neat sketch. (06 Marks)
- b. What is 'toughness' and 'modulus' of resilience? (04 Marks)
- c. Explain with a neat sketch, the Stress – Strain diagram for a ductile material. (10 Marks)

OR

- 2 a. What is Hardness? Discuss Vickers's Hardness Test. (06 Marks)
- b. Discuss Bauchinger's effect. (04 Marks)
- c. With neat sketches, explain Charpy and Izod Impact Tests. (10 Marks)

### Module-2

- 3 a. Compare Cast and Wrought Aluminum Alloys. (06 Marks)
- b. Elaborate Age hardening process of Aluminum Alloys. (06 Marks)
- c. Explain the characteristics and applications of Magnesium Alloys. (08 Marks)

OR

- 4 a. Discuss the applications of Titanium Alloys. (06 Marks)
- b. Explain the properties and applications of wood in Aircraft Industry. (08 Marks)
- c. Elaborate the use of glass in Aircraft construction. (06 Marks)

### Module-3

- 5 a. Define and classify Steel. (04 Marks)
- b. Explain the composition , properties and applications of low carbon steels and low alloy steels. (08 Marks)
- c. Discuss about Aircraft Steel Specifications. (08 Marks)

OR

- 6 a. What is a Maraging steel? Explain its types, properties and applications. (10 Marks)
- b. Discuss the types , characteristics and applications of Super alloys. (10 Marks)

### Module-4

- 7 a. What are Engineering Ceramics? What are their characteristics? (04 Marks)
- b. Explain the characteristics and applications of Alumina and Silicon Carbide. (10 Marks)
- c. Discuss the applications of carbon / carbon composites. (06 Marks)

OR

- 8 a. Define Composite. How do you classify Composites? (04 Marks)
- b. Explain the role of matrix and reinforcement in Composite materials. (06 Marks)
- c. With a neat sketch, explain Pultrusion process. (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.

**Module-5**

- 9 a. Discuss the considerations for selection of material to address the high temperature problems. (12 Marks)
- b. What factors are considered while selecting a ceramic coating and what are the advantages of Ceramic coating. (08 Marks)

**OR**

- 10 a. What is Creep? Explain creep curve with a neat sketch. (10 Marks)
- b. Discuss the characteristics and applications of Inconel and Stainless Steel as high temperature alloys. (10 Marks)

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