



CBCS SCHEME

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18MT32

Third Semester B.E. Degree Examination, Jan./Feb. 2021 Material Science and Technology

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Draw and explain the stress-strain diagram for Elastic, Ductile and Brittle materials with their salient points. (14 Marks)
b. Explain Fick's 1st Law of Diffusion. (06 Marks)

OR

- 2 a. Explain different types of Fatigue loading. (08 Marks)
b. Differentiate Ductile and Brittle fracture. (08 Marks)
c. Define Engineering strain and True strain. (04 Marks)

Module-2

- 3 a. Differentiate TTT diagram and Iron carbon diagram. (06 Marks)
b. Explain different types of Annealing process. (08 Marks)
c. Describe any two surface hardening methods. (06 Marks)

OR

- 4 a. Explain the composition, properties and use of Grey Cast Iron. (10 Marks)
b. Write a short note on Aluminium alloys and their application. (10 Marks)

Module-3

- 5 a. Explain Hume rothary rule. (10 Marks)
b. What is a solid solution? Describe types of solid solutions. (10 Marks)

OR

- 6 a. Explain Homogeneous and Heterogeneous Nucleation. Mention the differences between them. (14 Marks)
b. Describe Gibb's phase rule and define phase diagram. (06 Marks)

Module-4

- 7 a. With a neat figure explain hand lay-up technique in processing of composite materials. (12 Marks)
b. Describe the application and advantages of composite materials. (08 Marks)

OR

- 8 a. Define composite materials and classify them. (12 Marks)
b. Write a short note on
i) Metal matrix composites ii) Polymer matrix composites. (08 Marks)

Module-5

- 9 a. What are magneto rheological fluids? Describe its applications. (08 Marks)
b. Write a short note on characteristics and application of
i) Piezoelectric materials ii) Shape memory alloys (12 Marks)

OR

- 10 Write short note on
i) Accelerometers ii) Load Cell
iii) Torque Sensors iv) Pressure Sensors. (20 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.