



CBCS SCHEME

15MT32

Third Semester B.E. Degree Examination, June/July 2019

Material Science and Technology

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. With stress strain diagram of mild steel, explain the ductile and brittle behaviour of metal. (08 Marks)
b. Explain with neat figure, plastic deformation of single crystal by slip and twinning. (08 Marks)

OR

- 2 a. Explain the factors affecting diffusion. (04 Marks)
b. Explain briefly mechanical properties in elastic region and plastic region. (04 Marks)
c. Explain with figure, fatigue failure of materials. (08 Marks)

Module-2

- 3 a. Explain with figure Normalizing and Induction hardening. (08 Marks)
b. Write on Aluminium alloys. (08 Marks)

OR

- 4 a. What is Annealing? And explain types of annealing. (08 Marks)
b. Explain i) Grey cast iron ii) Malleable iron iii) S G Iron and Steel. (08 Marks)

Module-3

- 5 a. With phase diagram, explain Gibb's phase rule and Lever rule. (08 Marks)
b. Explain in detail Homogeneous nucleation. (08 Marks)

OR

- 6 a. Explain with figure Mechanism of solidification. (08 Marks)
b. Explain the Construction of phase diagram and Hume Rothery rules. (08 Marks)

Module-4

- 7 a. Explain in detail classification of composite material. (08 Marks)
b. Explain with figure Pultrusion process. (08 Marks)

OR

- 8 a. List the advantages, limitations and applications of composite materials. (08 Marks)
b. Explain with figure bag moulding and filament winding process. (08 Marks)

Module-5

- 9 Write note on :
a. Magnetostrictive material. b. Magnetorheological fluid.
c. Accelerometers. d. Load cells (16 Marks)

OR

- 10 a. Explain briefly Shape memory materials. (08 Marks)
b. Write a note on Force sensors. (08 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.