

CBCS SCHEME



17MT32

Third Semester B.E. Degree Examination, June/July 2019
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. With neat stress-strain diagram, explain the ductile and brittle properties of mild steel. (10 Marks)
b. Explain fatigue failure any two material by drawing S-N diagram. (05 Marks)
c. Define creep and explain three stages of creep. (05 Marks)

OR

- 2 a. Explain with neat figure deformation of single crystal by slip and twinning. (07 Marks)
b. Define fatigue and mechanism of fatigue. (04 Marks)
c. State Fick's laws of Diffusion and explain the factors affecting the diffusion. (09 Marks)

Module-2

- 3 a. Explain the construction of TTT diagram. (10 Marks)
b. List the properties, composition and uses of Copper alloys and aluminium alloys. (10 Marks)

OR

- 4 a. Explain normalizing and tempering heat treatment process. (14 Marks)
b. Explain briefly the composition, properties and uses of Grey Cast Iron and malleable iron. (06 Marks)

Module-3

- 5 a. Explain briefly the construction of binary phase diagram. (10 Marks)
b. Explain with neat figure the different types of cast metal structures. (10 Marks)

OR

- 6 a. Explain the different stages in solidification of metals and alloys. (10 Marks)
b. Explain the method of finding composition of metals at different temperature in binary phase diagram. (05 Marks)
c. Briefly explain Gibb's phase rule by taking any example. (05 Marks)

Module-4

- 7 a. Define composite material and explain its classification briefly. (10 Marks)
b. Briefly explain the manufacturing of composite products by filament winding and pultrusion process. (10 Marks)

OR

- 8 a. Write a brief note on matrix and reinforcement materials. (10 Marks)
b. Explain with neat figure manufacturing of composite materials by injection moulding. List its advantages and disadvantages. (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. Explain the working principle of shape memory alloys and fiber optic sensors in engineering application. (12 Marks)
b. Briefly explain the working method of accelerometers and force sensors. (08 Marks)

OR

- 10 Write note on:
a. Magnetolectric materials
b. Electrorheological fluids
c. Pressure sensors
d. Microphones

(20 Marks)

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