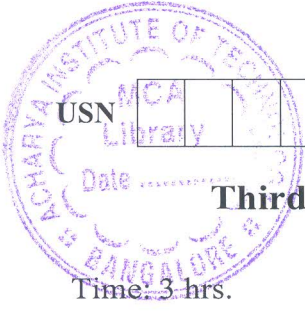


CBCS SCHEME

18ME34



USN

Date

Third Semester B.E. Degree Examination, June/July 2023

Material Science

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Draw the neat sketch of BCC and FCC structure and also find the APF of both the structure. (10 Marks)
- b. Explain point defects and Edge dislocation with necessary diagrams. (10 Marks)

OR

- 2 a. Explain linear and non-linear behavior of elastic properties of materials. (10 Marks)
- b. Explain slip and twinning. (05 Marks)
- c. Explain mechanisms of strengthening in metals. (05 Marks)

Module-2

- 3 a. Draw the S – N diagram for fatigue failure also explain mechanism of fatigue failure. (10 Marks)
- b. Draw the creep curve and explain the different stages of creep curve. (10 Marks)

OR

- 4 a. Explain the rule of Hume – Rothery to form the substitutional solid solution. (10 Marks)
- b. Draw the Iron carbon diagram and mark all the phases on it also explain ferrite and austenite structure. (10 Marks)

Module-3

- 5 a. Draw the T – T – T diagram and superimpose CCT diagram on it. Explain these two diagrams importance. (10 Marks)
- b. Explain Annealing, normalizing and tempering process. (10 Marks)

OR

- 6 a. Explain austempering and martempering processes with neat diagrams. (10 Marks)
- b. Explain carburizing, cyaniding and nitriding processes (10 Marks)

Module-4

- 7 a. Classify the composite based on matrix and reinforcement. Explain brief about the matrix and reinforcement. (10 Marks)
- b. Any two methods of production of PMCs. (10 Marks)

OR

- 8 a. Any two methods of production CMCs. (10 Marks)
- b. State the advantage and applications of composites. (10 Marks)

Module-5

- 9 a. Explain any two processing of plastics. (10 Marks)
- b. Write note on thermal and optical material - IS (10 Marks)

OR

- 10 a. Explain shape memory alloys and fiber optic materials. (10 Marks)
- b. Explain any two ceramics processing methods. (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.