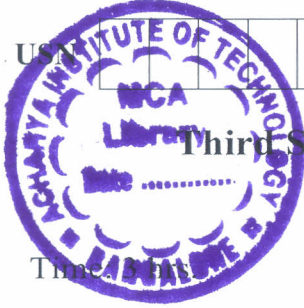


CBCS SCHEME

US



Third Semester B.E. Degree Examination, June/July 2025

Material Science

18ME34

Time

Max. Marks: 100

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

Module-1

- 1 a. Define APF and derive an equation for APF in simple cubic structures. (10 Marks)
- b. State and explain Fick's laws of diffusion. (10 Marks)

OR

- 2 a. With a graph, explain stress-strain diagram for ductile material. (10 Marks)
- b. Define : (i) Stiffness (ii) Yield strength (iii) Ductility (iv) Toughness (v) U.T.S (10 Marks)

Module-2

- 3 a. With a sketch explain R-R Moore fatigue testing. (10 Marks)
- b. Explain with a graph three stages of creep. (10 Marks)

OR

- 4 a. State and explain Hume – Rothery rules. (10 Marks)
- b. With a graph explain Iron – Carbon equilibrium diagram. (10 Marks)

Module-3

- 5 a. Define Annealing and explain its different types. (10 Marks)
- b. With sketch explain Jominey End Quench test. (10 Marks)

OR

- 6 a. With sketch explain carburizing process. (10 Marks)
- b. Explain Flame-Hardening process. (10 Marks)

Module-4

- 7 a. With a neat sketch, explain hand-layup process. (10 Marks)
- b. Explain filament winding process in composite materials. (10 Marks)

OR

- 8 a. Explain pultrusion process in composite materials. (10 Marks)
- b. Determine Young's Modulus with ISO - strain condition. (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 various types of polymers and its applications. (10 Marks)
b. Write properties and applications of ceramics. (10 Marks)

OR

10 Write short notes on :

- a. Optical materials
b. Thermal materials
c. Shape memory alloys
d. Piezo-Electric materials

(20 Marks)
