

GBCS SCHEME

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18ME654

Sixth Semester B.E. Degree Examination, July/August 2022

Advanced Materials Technology

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. What are the factors to be considered for selection of an engineering materials. (10 Marks)
b. What are the desired properties or characteristics of surface – engineered components? Explain briefly. (10 Marks)

OR

- 2 a. Give the classification of engineering materials. Explain briefly the mechanical properties required for a component. (10 Marks)
b. Write a note on relationship between materials selection and processing. (10 Marks)

Module-2

- 3 a. Define composite. Give the classification –based on matrix materials and based on geometry of reinforcement. Also mention the role of matrix and reinforcement materials. (10 Marks)
b. With a neat sketch explain briefly the filament winding process and mention the applications. (10 Marks)

OR

- 4 a. With a neat sketch explain briefly the pultrusion process and mention the applications. (10 Marks)
b. Explain briefly the autoclave bag molding process with a suitable sketch. (10 Marks)

Module-3

- 5 a. Give the classification of Bio-ceramic materials and explain briefly the porous ceramic materials and its applications. (10 Marks)
b. Enumerate the calcium phosphate coating techniques. Explain briefly plasma spray technique for clinical applications. (10 Marks)

OR

- 6 a. Explain briefly the requirements for high temperature materials. (10 Marks)
b. Explain the application of high temperature materials. (10 Marks)

Module-4

- 7 a. Explain briefly the production of Dual Phase (DP) Steels and its applications. (10 Marks)
b. Explain briefly the properties and applications of HSLA (High Strength Low Alloy) steels. (10 Marks)

OR

- 8 a. Give the classification of polymers on the basis of thermal response and explain the characteristics and applications of polymers. (10 Marks)
b. Discuss the production techniques of fibers and foams. (10 Marks)

Module-5

- 9 a. Write a short note on smart materials and shape memory alloys. (10 Marks)
b. What do you mean by carbon nano tubes? Write the different types of nano tubes. Explain briefly. (10 Marks)

OR

- 10 a. Discuss the advantages and applications of nano-crystalline materials. (10 Marks)
b. Explain briefly the properties and applications of metallic glasses. (10 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.