

# CBCS SCHEME

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18CH44

## Fourth 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. Explain in detail the classification of materials based on their nature and based on uses. (10 Marks)  
b. With a neat sketch, explain the Bravais space lattices. (10 Marks)

OR

- 2 a. Describe how crystal structure is determined using Bragg's law. (10 Marks)  
b. Define coordination number and atomic packing factor. Evaluate the values of the same for simple cube, and BCC structure. (10 Marks)

### Module-2

- 3 a. Discuss the various kinds of point imperfections with suitable examples. (10 Marks)  
b. Explain in detail about screw and edge dislocations with suitable examples. (10 Marks)

OR

- 4 Write short notes on:  
a. Phase rule  
b. Line imperfections  
c. Lever rule  
d. Surface imperfections (20 Marks)

### Module-3

- 5 a. Explain the phenomena of elastic and plastic deformation of ductile material. (10 Marks)  
b. What is creep? Explain phenomena and occurrence of creep. (10 Marks)

OR

- 6 Describe the following:  
a. Annealing  
b. Normalizing  
c. Tempering  
d. Hardening (20 Marks)

### Module-4

- 7 a. What is corrosion? Briefly explain the classification of corrosion. (10 Marks)  
b. Explain the various methods available to prevent corrosion. (10 Marks)

OR

- 8 a. What are the factors influencing the rate of corrosion? Explain. (10 Marks)  
b. Write notes on: (i) Passivity (ii) Inhibitors (10 Marks)

### Module-5

- 9 a. Discuss the applications of Ferrous metals and its alloys. (10 Marks)  
b. Discuss the applications of aluminum and its alloys. (10 Marks)

OR

- 10 Write short notes on:  
a. Copper and its alloys  
b. Ceramic materials  
c. Refractories  
d. Plastics (20 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.