

CBCS SCHEME

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17NT32

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Basic of 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. Write a brief note on Nanomaterial and their classification. (10 Marks)
b. What are the Piezo – electric materials and ferro-electric materials? Explain their application with example. (10 Marks)

OR

- 2 a. Describe the importance of polymeric and Biomaterials with suitable examples. (10 Marks)
b. Explain the importance and applications of :
i) Pyroelectric materials ii) Metallic glass. (10 Marks)

Module-2

- 3 a. Explain briefly the factor influencing the resistivity of electrical materials. (10 Marks)
b. Distinguish p-n Junction diode and rectifiers and describe the working of p-n junction diode. (10 Marks)

OR

- 4 a. Explain in detail about conductors, semiconductor and insulators with the help of band gap energy and bonding model. (12 Marks)
b. What are semiconductor devices? Explain brief about rectifier and p-n rectifying junction. (08 Marks)

Module-3

- 5 a. What is absorption spectroscopy? Explain the concept of measuring absorbance. (10 Marks)
b. What are photo conductive the materials? Write a short note on photo conductive devices. (10 Marks)

OR

- 6 a. What are photodetectors? Explain the mechanism of detection. (10 Marks)
b. Write a short note on birefringence and birefringent materials. Mention their application. (10 Marks)

Module-4

- 7 a. Define heat capacity. Explain briefly about specific, molar and volume heat capacities. Mention the factors affecting Sp. heat capacity. (10 Marks)
b. Write a note on magnetic moment and differentiate magnetic moment and angular momentum. (05 Marks)
c. State and derive the expression for Fourier's law. (05 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.

OR

- 8 a. Explain the properties and applications of magnetic thin films and magnetic bubbles. (10 Marks)
- b. Which are the factors affecting thermal expansion? Explanation about the application of thermal expansion property. (05 Marks)
- c. Define the followings :
Dipole moment, magnetic flux density magnetic fluid strength, magnetic susceptibility and magnetic permeability. (05 Marks)

Module-5

- 9 a. Define and explain the impact strength and Fatigue. (10 Marks)
- b. Write a note on the point defect of materials. (10 Marks)

OR

- 10 a. What is hardness? Explain about Brinell and Rockwell test (10 Marks)
- b. Write a brief note on mechanical properties of materials. (10 Marks)
