

CBCS Scheme

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15NT32

Third Semester B.E. Degree Examination, Dec.2016/Jan.2017

Basics of Material Science

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Give the classification and importance of rheological fluids. (06 Marks)
b. What are chromic materials? Mention its classification. (04 Marks)
c. Explain about the importance and applications of advanced ceramic materials. (06 Marks)

OR

- 2 a. Discuss in detail about shape memory materials. (08 Marks)
b. Write a note on nanomaterials and their classifications. (08 Marks)

Module-2

- 3 a. Define drift velocity and electron mobility. What is the relationship between drift velocity and electron mobility? (06 Marks)
b. What is electrical resistivity? Explain the measurement of electrical resistance by four probe method. (10 Marks)

OR

- 4 a. Distinguish between BJT and MOSFETs. (04 Marks)
b. With the help of band gap energy, and bonding model explain in detail about conductors, semiconductor, and insulators. (12 Marks)

Module-3

- 5 a. Which are the factors affecting thermal expansion? Explain about the applications of thermal expansion property. (05 Marks)
b. Define specific, molar and volume heat capacities. Mention the factors affecting specific heat capacity. (05 Marks)
c. Differentiate between hard and soft magnetic materials. (06 Marks)

OR

- 6 a. Write a short note on Bohr Magneton. (04 Marks)
b. Discuss about importance and applications of OMR and GMR. (08 Marks)
c. Define the following: magnetic depole, dipolemoment, susceptibility and permeability. (04 Marks)

Module-4

- 7 a. Brief about luminescence, its types and applications. (08 Marks)
b. Write a short note on birefringence and birefringence materials. (08 Marks)

OR

- 8 a. Write a detailed note on scattering. (08 Marks)
b. What are liquid crystals? Explain briefly about the construction and working of LCDs. (08 Marks)

Module-5

- 9 a. Write a brief note on point defects of materials. (10 Marks)
b. What is UTM? Discuss about the components of UTM. (06 Marks)

OR

- 10 a. What is hardness? Explain about Brinell, and Rockwell hardness, tests. (10 Marks)
b. Explain about edge dislocation and screw dislocation. (06 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.