CBCS SCHEME

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15NT42

Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Material Science and Engineering

Time: 3 hrs. Max. Marks: 80

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

Module-1

1 a. Discuss classification of materials based on structure. **(08 Marks)**
b. Describe the Electronic structure of the atom. **(08 Marks)**

OR

2 a. Discuss about materials design and selection. **(04 Marks)**
b. Explain different types of atomic bondings, with examples. **(08 Marks)**
c. Define Amorphous materials. Discuss the principle and technological applications of amorphous materials. **(04 Marks)**

Module-2

3 a. Give a brief introduction to unit cell and miller indices in a crystal. **(08 Marks)**
b. Distinguish between Crystalline solids and Amorphous solids. **(04 Marks)**
c. Write a note on Crystallographic point groups. **(04 Marks)**

OR

4 a. Explain different types of crystal systems, with neat diagrams and parameters. **(10 Marks)**
b. Explain about Bravais lattices in three dimensional spaces. **(06 Marks)**

Module-3

5 a. Explain diffusion in the context of different disciplines. **(06 Marks)**
b. Describe the mechanism of diffusion in solids. **(10 Marks)**

OR

6 a. Discuss different factors affecting diffusion. **(06 Marks)**
b. Explain about diffusion and material processing. Mention applications of diffusion. **(10 Marks)**

Module-4

7 a. Discuss about Thermotropic liquid crystals and Lyotropic liquid crystals. **(06 Marks)**
b. Explain Molecular Ordering in smectic liquid crystals. Mention its application. **(10 Marks)**

OR

8 a. What is Homologous series? Explain crystalline behavoiur in Para – alkylazoxy benzene homologous series. **(08 Marks)**
b. Discuss applications of Chiral liquid crystals in thermography. **(08 Marks)**

Module-5

9 a. What are Ceramics? Discuss Electrical properties of ceramics. **(10 Marks)**
b. What are Ferrofluids? Explain different applications of ferrofluids. **(06 Marks)**

OR

10 a. Discuss Bonding and applications of ceramics. **(06 Marks)**
b. Explain in brief Piezoelectric materials mechanism and applications. **(10 Marks)**

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