

C 20664

(Pages : 2)

Name.....

Reg. No.....

SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS—UG)

Physics/Applied Physics

PHY 6B 14 (EL3)—MATERIALS SCIENCE

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

*The symbols used in question paper have their usual meanings.***Section A (Short Answer Type)***Answer at least eight questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. Explain the basic components of the discipline materials science and engineering.
2. Why is it so that the properties of polycrystalline materials usually isotropic ?
3. Using a suitable figure, explain a self-interstitial.
4. What is Burgers vector ?
5. Give Fick's first law of diffusion and explain the terms involved.
6. Give expression indicating the temperature dependence of diffusion co-efficient and explain the terms involved.
7. Explain what you mean by macromolecules.
8. Distinguish between homopolymers and copolymers.
9. What are the prerequisites of abrasives ? Give an example.
10. Discuss the structures of any four types of repeating units in polymeric materials.
11. What are the applications of Laue's method ?
12. Explain the term optical microscopy.

(8 × 3 = 24 marks)

Turn over

Section B (Paragraph/Problem Type)

Answer at least five questions.

Each question carries 5 marks.

All questions can be attended.

Overall Ceiling 25.

13. What are advanced materials? Discuss their applications.
14. Give a graph representing the variation of attractive, repulsive and the resultant force on the inter atomic separation for two isolated atoms.
15. Distinguish between edge and screw dislocation in solids.
16. Distinguish between steady state and non-steady state diffusion.
17. Discuss briefly the different molecular structures in polymers.
18. Obtain the Bragg's law of x-ray diffraction.
19. Write short note on scanning probe microscopy.

(5 × 5 = 25 marks)

Section C (Essay Type)

Answer any one question.

The question carries 11 marks.

20. Discuss the formation of (i) Covalent ; and (ii) Van der Waals bonding in solids.
21. Explain briefly the mechanical properties of ceramics.

(1 × 11 = 11 marks)