C 40631

(Pages : 2)

Name.....

Reg. No.....

SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2023

(CBCSS)

Physics

PHY 6B 14 (EL3)—MATERIALS SCIENCE

(2019 Admission onwards)

Time : Two Hours

Maximum Marks : 60

Section A (Short Answer Type)

Answer **all** *questions in two* **or** *three sentences.*
Each question carries 2 *marks.*

1. What is theme of materials science and engineering ?
2. What are smart materials ? What are their components ?
3. Discuss the origin of ionic bonding in NaCl.
4. Explain polymorphism using an example.
5. Draw the [111] and [110] directions in a cubic unit cell.
6. What do you mean by a solid solution ?
7. Give Fick's second law of diffusion and explain the terms involved.
8. What do you mean by an abrasive ceramic ?
9. Explain the term stoichiometry with an example.
10. Distinguish between thermosetting and thermoplastic polymers.
11. What are the methods used to determine the grain size of a sample ?
12. Discuss two applications of a scanning probe microscope.

(Ceiling marks = 20 marks)

Section B (Paragraph/Problem Type)

Answer **all** *questions in* **a paragraph** *of about* **half a page** *to* **one** *page.*
Each question carries 5 *marks.*

13. What do you mean by a composite material ? Why we prepare a composite material ? Give an example.
14. Write short note on close packed structures in solids.

Turn over

15. Discuss the importance of aluminium for integrated circuit interconnects.
16. Write short note on the different structures in ceramics.
17. What are co-polymers ? What are the different types of co-polymers ?
18. Using a schematic, explain an X-ray diffractometer.
19. What is the use of transmission electron microscopy ? Explain the basic principle of this technique.

(Ceiling marks = 30 marks

Section C (Essay Type)

Answer any **one** *question in about* **two** *pages.*
The question carries 10 *marks*

20. Describe the linear defects in solids.
21. Discuss the stress-strain behaviour and viscoelastic deformation of polymers.

(1 × 10 = 10 marks