

B 255 NRR

B.Sc. DEGREE EXAMINATION, JULY 2023.

Fifth Semester

Physics

GE-1 : MATERIAL SCIENCE

(From 2017-18 onwards)

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. How a metal is different from a semiconductor?
2. Name the different types of magnetic materials?
3. How nanomaterials are defined?
4. Name the different crystal growth processes.
5. What is the condition for growing large crystals?
6. What is the advantage of growing crystals by Bridgeman technique?
7. What are thin films?

8. How a p-type semiconductor is formed?
9. Why most of the metals have neutral grey appearance?
10. What is a thermistor?

SECTION B — (5 × 5 = 25 marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) Write a note on the electrical properties of insulators.

Or

- (b) Give a detailed account on composites.

12. (a) What are organic materials? Where they are used?

Or

- (b) How crystals are characterized by X-ray?

13. (a) Give an account on conduction of n type semiconductors.

Or

- (b) Brief the thermal and optical properties of materials.

14. (a) What is meant by fracture of metals? Explain.

Or

- (b) Compare and contrast elastic and plastic deformations in metals.

15. (a) How does a gas sensor work?

Or

- (b) Give an account on solar cells along with their applications.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Discuss different types of magnetic materials.
17. Brief Bridgeman crystal growth method with a neat diagram.
18. Explain the conductivity, resistivity and temperature dependent properties of thin films.
19. Give a detailed account on elastic deformation of metals.
20. What is NDT technique? Brief ultrasonic NDT method along with its three types.