

APRIL/MAY 2019

BEL31 — PHYSICS OF MATERIALS

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. What is an ionic bond?
2. What is a basis?
3. State Bragg's law..
4. What are soft X- rays?
5. State Matheissen's rule.
6. What is relaxation time?
7. What is an intrinsic semiconductor?
8. What is doping?
9. What is forward bias?
10. Define depletion region.



SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL the questions.

11. (a) Explain the seven crystal systems.

Or

- (b) Explain Bravais lattice.

12. (a) Explain the determination of crystal structure using powder method.

Or

- (b) Explain the determination of crystal structure using single crystal method.

13. (a) Derive an expression for mean free path and relaxation time.

Or

- (b) Obtain Wiedman-Franz law.

14. (a) Explain the law of mass action.

Or

- (b) Derive an expression for electron concentration in intrinsic semiconductors.

15. (a) Derive an expression for potential barriers.

Or

- (b) What is drift velocity and derive an expression for it.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the determination Miller indices.

17. Explain the working of Bragg's spectrometer.

18. Explain the Fermi level in n type and p type semiconductor.

19. Explain classification of solids on the basis of energy band theory.

20. Explain the Hall effect, Hall voltage and Hall coefficient in detail.

