C. ABDUL HAKEEM COLLEGE (AUTONOMOUS),
MELVISHARAM - 632 509.
SEMESTER EXAMINATIONS, APRIL - 2018

B.Sc., MATHEMATICS & CHEMISTRY **SEMESTER II**

U15APH201 /U14APH201 - PHYSICS - II (ALLIED)

Time: Three Hours Maximum: 60 Marks

SECTION - A (10 X 1 = 10 Marks)

Answer **ALL** Questions.

1. State Pauli's exclusion principle.
2. What are matter waves?
3. Define Thermal conductivity.
4. Define Fermi Energy.
5. What are semiconductors?
6. What is meant by Doping?
7. Define Unit cell.
8. What are Miller Indices?
9. What is a Zener Diode?
10. Draw the symbol and truth table of OR gate.

SECTION - B (5 X 4 = 20 Marks)

Answer **ALL** Questions.

11. a) Describe the two distinct features of Vector Atom Model.

(Or)

b) Discuss briefly the wave nature of matter and obtain an expression of de Broglie wavelength for matter waves.

12. a) Describe the salient features of Classical free electron theory of metals.

(Or)

b) Define Fermi distribution function and discuss the effect of temperature on Fermi function.

13. a) Describe the two types of extrinsic semiconductors.

(Or)

b) Derive an expression for the Band gap of an intrinsic semiconductor.

14. a) Distinguish Crystalline and Amorphous solids with examples.

(Or)

b) Calculate the Atomic Packing Factor for Face Centred Cubic Structure.

15. a) Describe the construction and uses of Light Emitting Diode.

(Or)

b) Describe the fabrication of integrated circuits by monolithic technology.

SECTION - C (3 X 10 = 30 Marks)

Answer **ANY THREE** Questions.

16. Explain Davisson and Germer's experiment for the study of electron diffraction.
17. Derive expressions for Electrical conductivity and Thermal conductivity. From that deduce an expression for Lorentz number.
18. Derive an expression for the carrier concentration of an intrinsic semiconductor.
19. Explain the 14 – Bravais lattices in detail with diagrams.
20. Explain how a zener diode can be used as a voltage regulator.

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