

BT-2/J07

8248

Physics-II

Paper : Phy-102 E

Time : Three Hours]

[Maximum Marks : 100

Note :- Attempt FIVE questions in all, selecting at least ONE from each unit

UNIT-I

1. (a) Discuss the following structures :
Zinc blende, Sodium Chloride and Magnesium. 9
- (b) Calculate the maximum radius of the interstitial sphere that can just fit into the void between the body centred atom of bcc structure 6
- (c) Differentiate between primitive cell and non-primitive cell. 5
2. (a) Explain X-ray powder method for investigating crystalline structure. 12
- (b) What do you understand by X-ray Spectra ? Discuss different types of X-ray Spectra. 8

UNIT-II

3. (a) What were the difficulties encountered with Classical Physics ? How were they solved ? Explain. 10
- (b) Derive Schrödinger wave equations. 10
4. Discuss quantum theory of free electrons and derive Richardson's thermionic equation. 20

UNIT-III

5. (a) What is HALL effect ? Derive necessary equations. 12
- (b) What are BRILLOUIN zones ? Explain. 8
5. (a) Differentiate between the classical model based concept of formation of energy bands and explain by Kronig Penny Model 15
- (b) Show that the width of allowed band decreases with increasing value of binding energy of electrons. 5

UNIT-IV

7. What do you understand by photoconductivity in insulating Crystals ? Describe a simple model which would explain the effect of variation of illumination and effect of traps. 20
8. Write detailed notes on :
 - (a) Superconductivity
 - (b) Ferromagnetism. 10×2= 20