



**Part B**

**5 x 6 = 30**

**Answer ALL questions**

**Each answer should not exceed 400 words or two pages**

11. a. Calculate the coordination number of diamond.  
(or)
11. b. Define the terms i: unit cell ii: Bravais lattice.
12. a. Describe the structure of Cesium chloride with a neat diagram.  
(or)
12. b. List the differences between diamond and zinc blende crystals.
13. a. Obtain an expression for electrical conductivity of a metal.  
(or)
13. b. Describe the experimental determination of Hall coefficient.
14. a. Obtain an expression for magnetic moment due to spin of nucleus.  
(or)
14. b. Write short notes on ferro magnetic materials.
15. a. Describe how the temperature and frequency affects the polarization.  
(or)
15. b. Derive Clausius – Mosotti equation.

**Part C**

**5 x 12 = 60**

**Answer ALL questions**

**Each answer should not exceed 800 words or fourpages**

16. a. Distinguish between the coordination number and the number of atoms per unit cell. Find both these numbers for; i: a simple cubic lattice, ii: a body centered cubic lattice and iii: a face centered cubic lattice?  
(or)
16. b. What are Miller indices? Describe the procedure for finding miller indices.
17. a. Describe the classification of solids.  
(or)
17. b. Describe the crystal structures of sodium chloride with suitable diagram and distinguish between atom sites and lattice points in a monoatomic FCC crystal and a NaCl crystal.
18. a. Explain the Kronig Penney model for an electron in a periodical potential. What are its consequences?  
(or)
18. b. Explain Hall effect. Obtain an expression for Hall coefficient.
19. a. Describe the Langevin's theory of paramagnetism.  
(or)
19. b. With a neat sketch explain Domain-Weiss theory of ferromagnetism.
20. a. Derive Local field. Obtain an expression for Lorentz internal field.  
(or)
20. b. Write short notes on electronic polarisation and ionic polarisation.

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