

# P I C S

PRADEEP SHARMA'S CHEMISTRY

# I N S T I T U T E

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## INSTRUCTIONS

1. Solve the Test On Plain Paper .
2. Finish the test In 1:30 Hr.
3. After completing the test Post your answer sheet for Evaluation to the following Address -

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## ALL INDIA TEST SERIES

XII

## Solid state

1. Explain the following terms with suitable examples:  
(i) Schottky defect (ii) Frenkel defect (iii) Interstitials and (iv) F-centres.
2. Aluminium crystallises in a cubic close-packed structure. Its metallic radius is 125 pm.  
(i) What is the length of the side of the unit cell?  
(ii) How many unit cells are there in 1.00 cm<sup>3</sup> of aluminium?
3. If NaCl is doped with 10<sup>-3</sup> mol % of SrCl<sub>2</sub>, what is the concentration of cation vacancies?
4. Explain the following with suitable examples:  
(i) Ferromagnetism (ii) Paramagnetism (iii) Ferrimagnetism (iv) Antiferromagnetism  
(v) 12-16 and 13-15 group compounds
5. Silver crystallises in fcc lattice. If edge length of the cell is 4.07 × 10<sup>-8</sup> cm and density is 10.5 g cm<sup>-3</sup>, calculate the atomic mass of silver.
6. A cubic solid is made of two elements P and Q. Atoms of Q are at the corners of the cube and P at the body-centre. What is the formula of the compound? What are the coordination numbers of P and Q?
7. Niobium crystallises in body-centred cubic structure. If density is 8.55 g cm<sup>-3</sup>, calculate atomic radius of niobium using its atomic mass 93 u.
8. How can you determine the atomic mass of an unknown metal if you know its density and the dimension of its unit cell? Explain.
9. What makes a glass different from a solid such as quartz? Under what conditions could quartz be converted into glass?
10. Non-stoichiometric cuprous oxide, Cu<sub>2</sub>O can be prepared in laboratory. In this oxide, copper to oxygen ratio is slightly less than 2:1. Can you account for the fact that this substance is a p-type semiconductor?

