SOLID STATE

MM 25

- 1 Mark Questions.
- 1) Why does conductivity of silicon increase with the rise in temperature?
- 2) Which type of defects are known as thermodynamic defects?
- 3) Solid A is very hard, electrical insulator in solid as well as in molten state and melts at extremely high temperature. What type of solid is it?
- 4) In Cacl<sub>2</sub> crystal, Cl ions form the cubic close packing. What sites are occupied by Ca ions.
- 5) What makes the crystal of KCI sometimes appear violet?
- 2 Mark Questions.
  - 6) Explain:

Time-1 Hr.

- (i) List two differences between metallic and ionic crystals.
- (ii) Sodium chloride is hard but sodium metal is soft.
- 7) What do you understand by the following types of stacking sequences.
- (i) ABABAB ...... (ii) ABCABC .....
- 8) In a fcc arrangement of A and B atoms A are present at the corners of the unit cell and B are present at the face canters. If one atom of A is missing from its position at the corner, what is the formula of the compound?
- 9) The concentration of cation vacancies in NaCl crystal doped with CdCl<sub>2</sub> is found to be 6.02 x 1016 mol<sup>-1.</sup> What is the concentration of CdCl<sub>2</sub> added to it?
- 10) Explain the following terms with one example each :(a) Ferrimagnetism (b) Antiferromagnetism

## 5 Mark questions

- 11) An element crystallises in a cubic close packed structure having a fcc unit cell of an edge 200 pm. Calculate the density if 200 g of this element contain  $24 \times 10^{23}$  atoms.
- 12) Analysis shows that a metal oxide has a empirical formula M<sub>0.96</sub>O. Calculate the percentage of M<sup>2+</sup> and M<sup>3+</sup> ions in this crystal.