Quality Checkers Only way to fulfill your dreams	12th Science : Chemistry Solid State,	**DATE:** **TIME: 1 hour** **MARKS: 25** SEAT NO:

Note:-

1. All Questions are compulsory.
2. Numbers on the right indicate full marks.

Section A

Q.1 Select and write the correct answer. **(4)**

1. A crystalline solid have

   A) Long range order B) Short range order

   C) Disordered arrangement D) None of these

2. The solid NaCl is a bad conductor of electricity since

   A) In solid NaCl there are no ions B) Solid NaCl is covalent

   C) In solid NaCl there is no velocity of ions D) In solid NaCl there are no electrons

3. Monoclinic crystal has dimension

   A) a $\neq$ b $\neq$ c, $\alpha = \beta = 90^o$, $\beta = 90^o$ B) a = b =c , $\alpha = \beta = \gamma = 90^o$

   C) a = b $\neq$ c, $\alpha = \beta = \gamma$ 90^o D) a $\neq$ b $\neq$ c, $\alpha \neq \beta \neq \gamma \neq 90^o$

4. Among solids the highest melting point is established by

   A) Covalent solids B) Ionic solids

   C) Pseudo solids D) Molecular solids

Q.2 Answer the following. **(3)**

1. Let a small quantity of phosphorus be doped into pure silicon
   (a) Will the resulting material contain the same number of total number of electrons as the original pure silicon?
   (b) Will the material be electrically neutral or charged?
2. What is packing efficiency?
3. Define Amorphous solids.

Section B
Attempt any Four

Q.3 Cesium chloride crystallizes in cubic unit cell with Cl^- ions at the corners and a Cs^+. ion in the centre of the cube. How many CsCl molecules are there in the unit cell? **(2)**

Q.4 What are Diamagnetic solids. Give examples. **(2)**

Q.5 Third layer of spheres is added to second layer so as to form hcp or ccp structure. What is the difference between the addition of third layer to form these hexagonal close-packed structures? **(2)**

Q.6 How many tetrahedral voids and octahedral voids are present in a closed packed structure? **(2)**

Q.7 What is meant by defects in crystal structure or solid? **(2)**

Q.8 Sodium metal crystallises in bcc lattice with cell edge, 4.29 $\overset{\circ}{\text{A}}$. What is radius of sodium atom? **(2)**

Section C
Attempt any Two

Q.9 Write a short note on Vacancy defect. **(3)**

Q.10 Unit cell of iron crystal has edge length of 288 pm and density of 7.86 g cm^{-3}. Determine the type of crystal lattice (Fe = 56) **(3)**
(Hint : Determine number of atoms of unit cell. It comes to 2, so, bcc type)

Q.11 Obtain the relationship between density of a substance and the edge length of unit cell. **(3)**

Section D
Attempt any One

Q.12 Explain AAAA type of three dimensional packing. Or Explain simple cubic structure (SC). **(4)**

Q.13 Calculate packing efficiency in the following crystals : **(4)**
1. Simple cubic (sc) structure
2. Body centred cubic (bcc) structure
3. Face centred cubic (fcc) structure OR Cubic close packing (ccp) structure.
Also calculate percentage of void space in each.