Choose the correct answer: **5 X 1 = 5**

1. Graphite and diamond are a) Covalent and molecular crystal b) ionic and covalent crystals c) both covalent crystals   d) both molecular crystals

2. CsCl has bcc arrangement, its unit cell edge length is 400pm, its inter atomic distance is

a) 400pm   b) 800pm   c) $\sqrt{3} \times 100$pm   d) $\sqrt{3}/2$ x 400pm

3. The vacant space in bcc lattice unit cell is

a) 48%   b) 23%   c) 32%   d) 26%

4. The yellow colour in NaCl crystal is due to

a) excitation of electrons in F centers   b) reflection of light from Cl-ion on the surface

c) refraction of light from Na+ ion   d) all of the above

5. The radius of an atom is 300pm, if it crystallizes in a face centered cubic lattice, the length of the edge of the unit cell is

a) 488.5pm   b) 848.5pm   c) 884.5pm   d) 484.5pm

Answer any four from the following: **4 x 2 = 8**

6. Define unit cell.

7. Differentiate between isotropy and anisotropy.

8. What are point defects?

9. Why Zno is colourless at room temperature?

10. What is coordination number? Write the coordination number in a BCC crystal.

Answer any four from the following: **4 x 3 = 12**

11. Give the characteristics of ionic crystals.

12. Write Bragg's equation and explain the terms involved in it.

13. Write a note on metal deficiency defect.

14. Calculate the packing efficiency in a simple cubic crystal.

15. Differentiate between crystalline and amorphous solids.

Answer the following: **2 x 5 = 10**

16. a) Derive the density of a unit cell.

    b) Barium has a body centered cubic unit cell with a length of 508 pm along an edge. What is the density of barium in g cm^{-3}?

(OR)

    Differentiate between Frenkel and Schottky defects with suitable diagrams.

17. Calculate the packing efficiency of a body-centered cubic crystal.

(OR)

    a) What is primitive and non primitive unit cell?   b) Explain the seven types of unit cell.