



# Quiz Question Prompts

## Fundamentals of Crystallography with Ansys Granta EduPack Software

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## Ansys Software Used

This resource uses Ansys Granta EduPack™ teaching software for materials education.

## Instructions

Below is a bank of multiple choice, True/False, and fill in the blank questions related to Crystallography for use in courses. Solution keys and different formats are available to instructors- see ReadMe file for details.

## Topic: Crystal Structures

1. The crystal structure of alpha brass is:
  - a. Face-centered cubic
  - b. Body-Centered cubic
  - c. Hexagonal close packed
  - d. Tetragonal
2. The crystal structure of beta brass is:
  - a. Body-centered cubic
  - b. Face-centered cubic
  - c. Hexagonal close packed
  - d. Body-centered tetragonal
3. The crystal structure of alpha ferrite is:
  - a. Face-centered cubic
  - b. Hexagonal close packed
  - c. Body-centered tetragonal
  - d. Body-centered cubic
4. The crystal structure of pure alpha tin is:
  - a. Body-centered cubic
  - b. Face-centered cubic
  - c. Diamond cubic
  - d. Hexagonal close packed
5. Which of the common 13 unit cells has the highest degree of symmetry?
  - a. Cubic
  - b. Hexagonal close packed
  - c. Rhombohedral
  - d. Monoclinic
6. Which of the common 13 unit cells has the lowest degree of symmetry?
  - a. Monoclinic
  - b. Cubic
  - c. Triclinic
  - d. Tetragonal

## Topic: Point Defects

1. A \_\_\_\_\_ occurs when an atom from the crystalline lattice rests in an interstitial site
  - a. Vacancy
  - b. Self-interstitial
  - c. Interstitial
  - d. Substitutional
2. A \_\_\_\_\_ occurs when an atom is missing from the crystalline lattice
  - a. Self-interstitial
  - b. Interstitial
  - c. Vacancy
  - d. Substitutional
3. A \_\_\_\_\_ occurs when a solute or impurity atom takes the spot of the host atom within the crystal lattice
  - a. Self-interstitial
  - b. Substitutional
  - c. Vacancy
  - d. Interstitial
4. A \_\_\_\_\_ occurs when a solute or impurity atom rests in the interstitial space within a crystal lattice
  - a. Vacancy
  - b. Substitutional
  - c. Self-Interstitial
  - d. Interstitial
5. T/F: A substitutional atom that is smaller than the host atoms puts the lattice under tension locally
6. T/F: A substitutional atom that is larger than the host atoms puts the lattice under tension locally
7. T/F Substitutional defects are always unwanted within a material

### Topic: Line/Planar Defects

1. T/F: Only edge dislocations can climb or have non-conservative motion
2. A \_\_\_\_\_ boundary exists between small crystals within a material that have different crystallographic orientations
  - a. Twin
  - b. Grain
  - c. Surface
  - d. Stacking Fault
3. Glide dislocation motion occurs when the \_\_\_\_\_ and \_\_\_\_\_ are in the plane of motion
4. T/F A twin boundary is a type of grain boundary
5. The burgers vector provides two pieces of information about the associated dislocation. What are those two things?
6. T/F Intrinsic stacking faults have a partial plane missing
7. T/F Extrinsic stacking faults have a partial plane missing

### Topic: Crystallographic Planes and Directions

1. The closest packed family of planes in FCC is \_\_\_\_\_
2. The closest packed family of directions in BCC is \_\_\_\_\_
3. T/F BCC crystals have a closest packed plane
4. The closest packed family of directions in FCC is \_\_\_\_\_
5. The closer packed family of planes in BCC is \_\_\_\_\_
6. The Atomic Packing Factor of FCC is \_\_\_\_\_
  - a. 0.74
  - b. 0.65
  - c. 0.87
  - d. 0.63

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