

X

NPTEL

reviewer4@nptel.iitm.ac.in ▼

Courses » Introduction to Materials Science and Engineering

Announcements **Course** Ask a Question Progress FAQ

Unit 5 - Week 2 - Crystallography II + Structure of Solids I

Register for
Certification exam

Course outline

How to access
the portal

Supplementary
Materials

Week 1 -
Crystallography
I

Week 2 -
Crystallography
II + Structure of
Solids I

- Week 2
Overview
- Week 2
Reading List
- 2.1 Miller
Indices of
Directions (18)
- 2.2 Miller
Indices for
Planes (18)
- 2.3 Miller
Indices for a
plane and its
normal in Cubic
Crystal (3)
- 2.4 Weiss Zone
law and its

Assignment 2

The due date for submitting this assignment has passed.

As per our records you have not submitted this **Due on 2019-02-13, 23:59 IST.**
assignment.

1) All body diagonals of a conventional unit cell of a tetragonal crystal with c/a ratio=2 is given **1 point**
by:

- [111]
- $\langle 111 \rangle$
- $\langle 112 \rangle$
- (111)

No, the answer is incorrect.

Score: 0

Accepted Answers:

$\langle 111 \rangle$

2) All the members of the symmetry related family of planes {100} in an orthorhombic lattice **1 point**
are given by:

- (100), $(\bar{1}00)$, (010), $(0\bar{1}0)$, (001), $(00\bar{1})$
- [100], $[\bar{1}00]$
- (100), $(\bar{1}00)$, (010), $(0\bar{1}0)$
- (100), (010), (001)

No, the answer is incorrect.

Score: 0

Accepted Answers:

[100], $[\bar{1}00]$

3) The plane containing the directions [001] and $[\bar{1}\bar{1}0]$ is **1 point**

© 2014 NPTEL - Privacy & Terms - Honor Code - FAQs -

A project of



NPTEL

National Programme on
Technology Enhanced Learning

In association with

NASSCOM®

Funded by

2.7 Close-packing of Hard Spheres (22)

2.8 ABAB stacking: Hexagonal Close-Packed (HCP) structure (20)

2.9 HCP crystal revised: Fractional coordinates of atoms in the motif (27)

2.10 c/a ratio of an ideal HCP crystal (12)

2.11 ABCABC stacking: Cubic Close-packing (CCP) (23)

Quiz : Assignment 2

Assignment 2 Solutions

Week 3 - Structure of Solids II

Week 4 - Structure of Solids III

Week 5 - Defects in Crystalline Solids I

Week 6 - Defects in Crystalline Solids II

Week 7 - Phase Diagrams I

Week 8 - Phase Diagrams II + Diffusion

Week 9 - Phase Transformations I

Week 10 - Phase Transformations II + Mechanical Behaviour of Materials I

Week 11 - Mechanical Behaviour of Materials II

Score: 0

Accepted Answers:
(110)

4) The line of intersection of the planes (111) and $(\bar{1}\bar{1}0)$ is

1 point

$[11\bar{2}]$

[201]

[110]

[111]

No, the answer is incorrect.

Score: 0

Accepted Answers:
 $[11\bar{2}]$

5) In Bragg's equation $\lambda = 2d \sin\theta$, the angle θ is the angle between

1 point

plane normal and the incident beam

transmitted and diffracted beam

half the angle between transmitted and diffracted beam

none of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:
half the angle between transmitted and diffracted beam

6) The close packed planes in a ccp crystal are given by {111}. If the stacking sequence is ABCABCABC... and the A layer is (111), the B layer will be:

1 point

(111)

$(\bar{1}\bar{1}\bar{1})$

(100)

Both a and b

No, the answer is incorrect.

Score: 0

Accepted Answers:
(111)

7) Which of the following stacking sequences will give rise to close packed structures?

1 point

P: ABCABCABC...

Q: ABABAB...

R: AABBAABB...

S: ABCBCABCBC...

P and Q only

P, Q and R

P, Q and S

P and R only

No, the answer is incorrect.

Score: 0

Accepted Answers:

Week 12 -
Mechanical
Behaviour of
Materials III +
Fracture

Interactive
Session

P, Q and S

8) The lattice parameter c and a of an HCP crystal are related to the dimensions of the tetrahedral voids in the structure. Choose the correct statement: **1 point**

- c is the height of the tetrahedron and a is the edge length of the tetrahedron
- c is the edge length of the tetrahedron and a is the height of the tetrahedron
- c is two times the edge length of the tetrahedron and a is the height of the tetrahedron
- c is two times the height of the tetrahedron and a is the edge length of the tetrahedron

No, the answer is incorrect.

Score: 0

Accepted Answers:

c is two times the height of the tetrahedron and a is the edge length of the tetrahedron

9) Packing fraction is defined as the volume occupied by the atoms in a unit cell divided by the volume of the unit cell. Let c be the packing fraction of ccp and h be the packing fraction of hcp. Choose the correct option: **1 point**

- $c = h$
- $c = 0.74h$
- $c < h$
- $c = 0.414h$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$c = h$

10) The plane normal to the close packed plane in a hcp crystal is along the _____ of the crystal **1 point**

- two-fold axis
- three-fold axis
- six-fold axis
- four-fold axis

No, the answer is incorrect.

Score: 0

Accepted Answers:

six-fold axis

Previous Page

End

