

Unit 4 - Structures of Materials

Course outline
How to access the portal?
Introduction to Materials
Introduction to Crystallography
Structures of Materials
<ul style="list-style-type: none"> Lecture 11: Miller Indices Part 2 Lecture 12: Miller Indices Part 3 Lecture 13: Miller Indices & Weiss Zone Law Lecture 14: Structure of Metals & Alloys Lecture 15: Structure of Metals, Packing, Coordination & Interstices
<input type="radio"/> Quiz : Assignment-3 <ul style="list-style-type: none"> Feedback From 3 Assignment-3: Solution
Solid Solutions & Structures
Classification of Ionic Solids
Non-Crystalline Solids
Structure Determination
Imperfections in Solids
Week-0

Assignment-3

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-09-18, 23:59 IST.

- 1) Atomic packing fraction of simple hexagonal lattice (in percent) is 1 point
- 74
 68
 60
 34
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
60
- 2) What is the multiplicity of {hkl} in a cubic system? 1 point
- 6
 12
 24
 48
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
48
- 3) What is the packing sequence of atoms in a FCC crystal (assuming each layer A, B, C is close packed)? 1 point
-ABCABCABCABCABCABCABCABC.....
ABABABABABABABAB.....
BACBACBACBACBAC.....
ABCACBACACBACACB.....
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
.....ABCABCABCABCABCABCABC.....
.....BACBACBACBACBAC.....
- 4) What is the approximate angle (in degree) between (120) and (012) planes in a cubic crystal? 1 point
- 0
 33
 66
 90
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
66
- 5) The atomic packing fraction in (110) plane of a BCC crystal is: 1 point
- 0.555
 0.833
 0.680
 0.45
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
0.833
- 6) In a point array of rectangular lattice, choose the correct option(s) belong to same family of directions. 1 point
- [10] and [01]
 [10] and [0 $\bar{1}$]
 [10] and [11]
 [11] and [$\bar{1}\bar{1}$]
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
[10] and [01]
[11] and [$\bar{1}\bar{1}$]
- 7) Choose the correct relation between plane and direction indices of four axes system in a hexagonal crystal. 1 point
- $h+k=i$ and $u+v=t$
 $h+k+i=1$ and $u+v+t=1$
 $h+k+i=0$ and $u+v+t=0$
 $h+k=1$ and $u+v=w$
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
 $h+k+i=0$ and $u+v+t=0$
- 8) Which of the following belong(s) to the same family of planes in a hexagonal system? 1 point
- $(2\bar{1}\bar{2}), (\bar{2}12)$ and $(1\bar{2}2)$
 $(2\bar{1}\bar{2}), (\bar{2}12)$ and $(1\bar{2}2)$
 $(112), (\bar{2}12)$ and $(1\bar{2}2)$
 $(212), (\bar{2}\bar{1}2)$ and (122)
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
 $(112), (\bar{2}12)$ and $(1\bar{2}2)$
- 9) Direction [120] in three axes system of a hexagonal crystal system can be represented by which of the following options in four axes system? 1 point
- $[11\bar{2}0]$
 $[01\bar{1}0]$
 $[\bar{1}100]$
 $[1\bar{2}10]$
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
 $[01\bar{1}0]$
- 10) Which of the following plane and direction are not perpendicular to each other in a tetragonal crystal system? 1 point
- (010) and [010]
 (110) and [110]
 (001) and [001]
 (101) and [101]
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
 (101) and $[101]$
- 11) What is the zone axis (i.e. [UVW]) of two planes (h_101_1) and $(0k_2l_2)$? 1 point
- $U = -k_2l_2, V = l_1h_2, W = h_1k_2$
 $U = k_2l_2, V = l_1h_2, W = h_1k_2$
 $U = -k_2l_2, V = -l_1h_2, W = -h_1k_2$
 $U = k_2l_2, V = -l_1h_2, W = -h_1k_2$
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
 $U = -k_2l_2, V = l_1h_2, W = h_1k_2$
- 12) Closely packed structures of atoms tend to have 1 point
- lower potential energy
 higher potential energy
 lower bond energy
 higher bond energy
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
lower potential energy
higher bond energy
- 13) Hexagonal closed packed lattice is a 1 point
- non-primitive lattice with motif at (0,0,0)
 non-primitive lattice with motif at (0,0,0) and $(1/3, 2/3, 1/2)$
 primitive lattice with motif at (0,0,0)
 primitive lattice with motif at (0,0,0) and $(1/3, 2/3, 1/2)$
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
primitive lattice with motif at (0,0,0) and $(1/3, 2/3, 1/2)$
- 14) Body centered cubic lattices have 1 point
- closed packed directions along $\langle 110 \rangle$
 closed packed directions along $\langle 111 \rangle$
 closed packed planes on {110}
 closed packed planes on {111}
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
closed packed directions along $\langle 111 \rangle$
- 15) Coordination number of atoms in a hexagonal closed packed structured crystal is 1 point
- 6
 9
 8
 12
- No, the answer is incorrect.**
Score: 0
Accepted Answers:
12