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Courses » Solid State Chemistry

Announcements

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Unit 6 - Week 4 : Symmetry in Crystals Part 2

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● Lecture 17 :
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● Lesson 18 :
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● Lecture 19 :
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Assignment 4

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2019-02-27, 23:59 IST.**

1) A screw rotation of 4_1 and another of 4_3 are related to each other. The relation is: **1 point**

The rotation angle of the 4_3 screw rotation is negative of the rotation angle of the 4_1 screw rotation.

The sum of rotation angles of the 4_1 screw rotation and the 4_3 screw rotation is 360° .

The translation component of the 4_1 screw rotation is the negative of that of the 4_3 screw rotation.

None of the other choices

No, the answer is incorrect.

Score: 0

Accepted Answers:

The translation component of the 4_1 screw rotation is the negative of that of the 4_3 screw rotation.

2) The number of new configurations (or operations) generated by a 6_2 screw axis of rotation is equal to **1 point**

2

3

5

6

No, the answer is incorrect.

Score: 0

Accepted Answers:

5

3) In a monatomic HCP crystal, the axis along the \vec{c} direction and passing through an atom is **1 point**

a

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Feedback For Week 4

Assignment 4 Solution

Week 5 : Crystal Systems, Point Groups and Space Groups

Week 6 : Crystallographic Notations

Week 7 : Coordination number, voids, defects in crystals

Interactive Session

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Week 9 : X - Ray Diffraction, X - Ray Crystallography & Electron Microscopy

Week 10 : Common Crystal Structures

Week 11 : Theory of Electronic Structure of Solids

Interaction Session

Week 12 : Theory of Electronic Structure of Solids, Part 2

3_1 screw axis

None of the other choices

No, the answer is incorrect.

Score: 0

Accepted Answers:

None of the other choices

4) The axis below which CANNOT be a valid screw axis of symmetry for any crystal is **1 point**

2_2

3_2

4_3

6_5

No, the answer is incorrect.

Score: 0

Accepted Answers:

2_2

5) Of the following screw axes of rotation, 3_1 , 3_2 , 6_2 , 6_4 , the pair(s) that are identical is(are) **1 point**

3_1 and 3_2 ; 6_2 and 6_4 ;

6_4 and 3_2 only

3_1 and 6_2 ; 3_2 and 6_4

None. All the screw rotations are distinct operations

No, the answer is incorrect.

Score: 0

Accepted Answers:

None. All the screw rotations are distinct operations

6) The CORRECT statement below regarding combination of symmetry operations is **1 point**

The combination of any two rotations is another rotation

The combination of any two reflections is another reflection

The combination of a rotation and a reflection is a rotoinversion

A combination of any two rotoinversions is a rotoinversion

No, the answer is incorrect.

Score: 0

Accepted Answers:

The combination of any two rotations is another rotation

7) Consider the conventional cubic unit cell of the FCC lattice with a corner at (0,0,0). The location of the glide plane(s) in this lattice (if any) is **1 point**

Perpendicular to any one of the crystallographic axes and passing through the origin

Perpendicular to any one of the crystallographic axes and intersecting the axis at a fractional distance of $1/4$.



Parallel to one of the crystallographic axes and intersecting the other two at 45°



None. There are no glide planes in an FCC lattice.

No, the answer is incorrect.

Score: 0

Accepted Answers:

Perpendicular to any one of the crystallographic axes and intersecting the axis at a fractional distance of $1/4$.

8) Which is the CORRECT statement about the diamond (d) glide ?

1 point



The diamond glide involves translation by $1/2$ along two crystallographic directions



The diamond glide involves translation by $1/4$ along two crystallographic directions.



A diamond glide can be present in a crystal without an inversion center.



A diamond glide generates 2 symmetry operations.

No, the answer is incorrect.

Score: 0

Accepted Answers:

The diamond glide involves translation by $1/4$ along two crystallographic directions.

9) The symbol  corresponds to a

1 point



glide reflection



a 4-fold rotoinversion axis



a 4_2 screw axis



None of the other choices

No, the answer is incorrect.

Score: 0

Accepted Answers:

a 4_2 screw axis

10) A dashed-dotted line  represents

1 point



an a , b , or c glide reflection plane in the plane of the screen



an a , b , or c glide reflection plane perpendicular to the plane of the screen



a mirror plane parallel to the plane of the screen



a diagonal glide reflection plane perpendicular to the plane of the screen

No, the answer is incorrect.

Score: 0

Accepted Answers:

a diagonal glide reflection plane perpendicular to the plane of the screen

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