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Courses » **Solid State Chemistry**

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Unit 6 - Week 4 : Symmetry in Crystals Part 2

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   ***1 point***
is equal to

○ 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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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 poi...*

○

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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