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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » **Chemical Applications of Symmetry and Group Theory (course)**

Announcements (announcements) **About the Course** (https://swayam.gov.in/nd1_noc20_cy13/preview)

Ask a Question (forum) Progress (student/home) Mentor (student/mentor)

Unit 3 - Week-1: Introduction to Symmetry elements, Symmetry operations and Group Theory

Course outline

How does an NPTEL online course work?

Week-1: Introduction to Symmetry elements, Symmetry operations and Group Theory

● Lecture 1 (unit? unit=22&lesson=23)

● Lecture 2 (unit? unit=22&lesson=25)

● Lecture 3 (unit? unit=22&lesson=26)

● Lecture 4 (unit? unit=22&lesson=27)

● Lecture 5 (unit? unit=22&lesson=28)

○ **Quiz :**
Assignment 1 (assessment? name=30)

Assignment 1

The due date for submitting this assignment has passed. **Due on 2020-02-12, 23:59 IST.**
As per our records you have not submitted this assignment.

1) Under the binary operation 'subtraction', the set of positive real numbers, R^+ , is **1 point**

- Group
 Abelian Group
 Not a group
 None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Not a group

2) Under the binary operation 'addition', a set of all integers Z (including zero) is **1 point**

- Not a group as it does not have inverse
 A Group
 Not a group as it is not associative
 Not a group as it does not have identity

No, the answer is incorrect.
Score: 0

Accepted Answers:
A Group

3) Under the binary operation 'multiplication', a set of all integers except zero **1 point**

Feedback 1
(unit?
unit=22&lesson=45)

Assignment 1
Solution (unit?
unit=22&lesson=54)

**Week 2-
Generation of
Symmetry
Operations from
Symmetry
Elements; Point
Group analysis;
Relation between
molecular
symmetry and
physical
properties(polarity
and chirality).**

**Week 3 -
Introduction to
Group
Multiplication
Tables;
Stereographic
Projections and
Matrix
Representations
of Symmetry
Operations**

**Week 4- Matrix
Representation
of Point Group,
Introduction to
Reducible and
Irreducible
Representation,
Description of
Character Table ,
Great
Orthogonality
Theorem and its
consequences**

**Week 5 -
Constructing
Character table
using the
consequences of
GOT, Relation
between group
theory and
quantum
mechanics,
Introduction to**

- Is not a group as it does not have inverse
- Is a Group
- Is not a group as it is not associative
- Is not a group as it does not have identity

No, the answer is incorrect.

Score: 0

Accepted Answers:

Is not a group as it does not have inverse

4) Under the binary operation 'multiplication', a set of all rational numbers greater than zero **1 point**

- Is not a group as it does not have inverse
- Is a Group
- Is not a group as it is not associative
- Is not a group as it does not have identity

No, the answer is incorrect.

Score: 0

Accepted Answers:

Is a Group

5) Which of the following symmetry operations is **NOT** present in H₂O ? **1 point**

- C₂
- σ_v
- E
- C₃

No, the answer is incorrect.

Score: 0

Accepted Answers:

C₃

6) Which of the following symmetry operations is **NOT** applicable for an A4 paper sheet **1 point**

- C₂
- C₄
- σ
- i

No, the answer is incorrect.

Score: 0

Accepted Answers:

C₄

7) Which of the following **DOES NOT** has an inversion centre **1 point**

- CHCl₃
- trans C₂H₂Cl₂
- Benzene
- Ethylene

No, the answer is incorrect.

Score: 0

Accepted Answers:

CHCl₃

8) Which of the following **does not** contain improper axis of rotation **1 point**

- CH₄

**Symmetry
Adapted Linear
Combinations:
Projection
operator.**

**Week 6 -
Projection
operator, concept
of Symmetry
Adapted Linear
Combination(SALC),
concept of Linear
Combination of
Atomic
Orbitals(LCAO),LCAO-
MO, Hückle
Approximations
and Introduction
to Normal Mode
of Vibration.**

**Week 7 -
Molecular
Vibrations:
Normal modes
and their
symmetry
aspects,
Selection rules of
fundamental
vibrational
transitions.**

Text Transcripts

**Week - 8 -
Electronic
Transitions**

**DOWNLOAD
VIDEOS**

- SO₂
- CCl₄
- allene

No, the answer is incorrect.

Score: 0

Accepted Answers:

SO₂

9) Total number of symmetry operations present in CHCl₃ molecule

1 point

- 7
- 4
- 6
- 3

No, the answer is incorrect.

Score: 0

Accepted Answers:

6

10) Which of the following symmetry element is **NOT** present in BF₃

1 point

- C₃
- C₂
- i
- σ_h

No, the answer is incorrect.

Score: 0

Accepted Answers:

i

