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reviewer3@nptel.iitm.ac.in ▾

Courses » Theory of groups for physics applications

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Unit 2 - Week 1

Course outline

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Week 1

- Lecture 1: Introduction
- Lecture 2: Algebraic Preliminaries
- Lecture 3: Basic Group Concepts & Low Order Groups-I
- Lecture 4: Basic Group Concepts & Low Order Groups-II
- Week1 Lecture Slides and Reading Materials
- Download Videos
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- Quiz : Week 1-Assignment 1-MCQ
- Week1-Assignment1-Solutions

Week 1-Assignment 1-MCQ

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment. **Due on 2018-08-15, 23:59 IST.**

1) The set of all positive real numbers along with the operation of addition is not a group because ***1 point***

- Addition is not a binary operation
- Addition is not associative
- Identity element exists but inverse element does not exist
- Inverse element does not exist

No, the answer is incorrect.
Score: 0

Accepted Answers:
Inverse element does not exist

2) If mapping is both the ``into" and ``onto" then the mapping is called ***1 point***

- Surjective
- Bijective
- Injective
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Bijective

3) The inverse of " i " in the multiplicative group, $\{1, -1, i, -i\}$ is ***1 point***

- -1

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Score: 0

Accepted Answers:
$-i$

4) Let $G = \{$ The set of all $n \times n$ non-singular matrices with rational numbers,$*\}$, then G is a/an **1 point**

- Finite, Non Abelian Group
- Infinite, Non Abelian Group
- Finite, Abelian Group
- Infinite, Abelian Group

No, the answer is incorrect.
Score: 0

Accepted Answers:
Infinite, Non Abelian Group

5) The inverse of the following permutation in $S_7, \pi_1 = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 3 & 4 & 7 & 6 & 2 & 1 & 5 \end{pmatrix}$ is, **1 point**

- $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 6 & 5 & 4 & 3 & 2 & 7 & 1 \end{pmatrix}$
- $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 6 & 5 & 2 & 1 & 4 & 7 & 3 \end{pmatrix}$
- $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 6 & 1 & 5 & 2 & 7 & 4 & 3 \end{pmatrix}$
- $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 6 & 5 & 1 & 2 & 7 & 4 & 3 \end{pmatrix}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 6 & 5 & 1 & 2 & 7 & 4 & 3 \end{pmatrix}$

6) The Linear Vector Space (LVS) is considered as Complex or Real depending upon, **1 point**

- Vectors residing within LVS
- Operators residing within LVS
- Scalars belong to $\mathbb{C}$ (complex numbers)
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Scalars belong to $\mathbb{C}$ (complex numbers)

7) The Cyclic group of order 12 is generated by **1 point**

$e^{\pi i/6}$

$e^{2\pi i/6}$

$e^{\pi i/12}$

$e^{\pi i/4}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$e^{\pi i/6}$

8) Identify the order of the group for the following pattern (Ignore the shading or colour variations) ***1 point***

5
10
15
2

No, the answer is incorrect.
Score: 0

Accepted Answers:
10

9) Also identify the whole symmetry group of the pattern shown in Question. 8, ***1 point***

$C_5 \otimes C_2^5$

C_5

C_5^2

$\mathbb{Z}_2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$C_5 \otimes C_2^5$

10) The set of rotations of a rigid body about a fixed point constitute **1 point**

- An abelian Group
- Symmetric Group
- Cyclic Group
- A non-Abelian Group

No, the answer is incorrect.
Score: 0

Accepted Answers:
A non-Abelian Group

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