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Courses » Theory of groups for physics applications

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Unit 8 - Week 7

Course outline

How to access the portal

Week 1

Week 2

Week 3

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Week 6

Week 7

● Lecture 25: Preliminaries About The Continuum-I

● Lecture 26: Preliminaries About The Continuum-II

● Lecture 27: Classical Groups-I

● Lecture 28: Classical Groups-II


○ Week7-Lecture Slides and Reading Materials

Week 7-Assignment 7-MCQ

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2018-09-19, 23:59 IST.**

1) 1 point

The dimension of the $SU(4)$ representation obtained from the Young tableau  is

- 15
- 20
- 4
- 16

No, the answer is incorrect.

Score: 0

Accepted Answers:

20

2) Every motion of a rigid body is equivalent to, 1 point

Only translation of the center of mass(CM) by a vector.

Only rotation about some axis \hat{n} by angle θ .

Both translation of the CM by a vector and rotation about some axis \hat{n} by angle θ .

None of the above.

No, the answer is incorrect.

Score: 0

Accepted Answers:

Both translation of the CM by a vector and rotation about some axis \hat{n} by angle θ .

3) For any arbitrary vectors $x, y, z \in \mathcal{V}$ (where \mathcal{V} is Linear Vector Space) and 1 point

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7-MCQ

Week7-
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Week 12

$$(x, ay + bz) = a^*(x, y) + b^*(x, z)$$

$$(x, y) = (y, x)$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$(ax + by, z) = a^*(x, z) + b^*(y, z)$$

4) A set whose (points) elements can be put in one-one correspondence with natural numbers upto a specific number N is called

1 point

enumerable set.

denumerable set

continuous set

densed set

No, the answer is incorrect.

Score: 0

Accepted Answers:

enumerable set.

5) Schwarz inequality for all vectors \mathbf{u} and \mathbf{v} of an inner product space can be stated as (where $\langle \cdot, \cdot \rangle$ is the inner product),

1 point

$$|\langle \mathbf{u}, \mathbf{v} \rangle| \leq \langle \mathbf{u}, \mathbf{u} \rangle \cdot \langle \mathbf{v}, \mathbf{v} \rangle$$

$$|\langle \mathbf{u}, \mathbf{v} \rangle|^2 = \langle \mathbf{u}, \mathbf{u} \rangle \cdot \langle \mathbf{v}, \mathbf{v} \rangle$$

$$|\langle \mathbf{u}, \mathbf{v} \rangle|^2 \geq \langle \mathbf{u}, \mathbf{u} \rangle \cdot \langle \mathbf{v}, \mathbf{v} \rangle$$

$$|\langle \mathbf{u}, \mathbf{v} \rangle|^2 \leq \langle \mathbf{u}, \mathbf{u} \rangle \cdot \langle \mathbf{v}, \mathbf{v} \rangle$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$|\langle \mathbf{u}, \mathbf{v} \rangle|^2 \leq \langle \mathbf{u}, \mathbf{u} \rangle \cdot \langle \mathbf{v}, \mathbf{v} \rangle$$

6) Time reversal in Minkowski space in 4 dimension with metric signature, $\eta_{\mu\nu} = \{1, -1, -1, -1\}$ can be termed as

1 point

Identity

Improper rotation

Proper rotation

None of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

Improper rotation

7) Number of independent parameters of group $SL(2, \mathbb{C})$ is

1 point

6

- 7
- 4
- 2

No, the answer is incorrect.

Score: 0

Accepted Answers:

6

8) Lorentz group in 4 dimensions contains

1 point

- 3 spatial rotations + time translation
- 4 spacetime translations + 3 velocity boosts
- 3 spatial translations + 3 velocity boosts
- 3 spatial rotations + 3 velocity boosts

No, the answer is incorrect.

Score: 0

Accepted Answers:

3 spatial rotations + 3 velocity boosts

9) The group of one dimensional translations is

1 point

- a compact group
- a non-compact group
- a discrete group
- a non-abelian group

No, the answer is incorrect.

Score: 0

Accepted Answers:

a non-compact group

10) The order of a continuous group depends on

1 point

- number of group elements near the identity.
- number of group elements.
- number of independent group parameters.
- dimension of spacetime.

No, the answer is incorrect.

Score: 0

Accepted Answers:

number of independent group parameters.

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