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) 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,
   - Only translation of the center of mass (CM) by a vector.
   - Only rotation about some axis $\hat{n}$ by angle $\theta$.
   - Both translation of the CM by a vector and rotation about some axis $\hat{n}$ by angle $\theta$.
   - 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 $\theta$.

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

   Score: 1 point
   Accepted Answers: Both translation of the CM by a vector and rotation about some axis $\hat{n}$ by angle $\theta$. 
(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 up to a specific number \(N\) is called

- enumerable set.
- denumerable set
- continuous set
- dense 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

- \(|\langle \mathbf{u}, \mathbf{v} \rangle| \leq \langle \mathbf{u}, \mathbf{u} \rangle \cdot \langle \mathbf{v}, \mathbf{v} \rangle\)
- \(|\langle \mathbf{u}, \mathbf{v} \rangle|^2 = \langle \mathbf{u}, \mathbf{u} \rangle \cdot \langle \mathbf{v}, \mathbf{v} \rangle\)
- \(|\langle \mathbf{u}, \mathbf{v} \rangle|^2 \geq \langle \mathbf{u}, \mathbf{u} \rangle \cdot \langle \mathbf{v}, \mathbf{v} \rangle\)
- \(|\langle \mathbf{u}, \mathbf{v} \rangle|^2 \leq \langle \mathbf{u}, \mathbf{u} \rangle \cdot \langle \mathbf{v}, \mathbf{v} \rangle\)

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

- 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

6 points
8) Lorentz group in 4 dimensions contains

- 3 spatial rotations + time translation 1 point
- 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

- a compact group 1 point
- 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

- 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.