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NPTEL

Unit 10 - Week 9

Week 9-Assignment 9-MCQ

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment. **Due on 2018-10-03, 23:59 IST.**

1) ***1 point***

From infinitesimal rotation about x axis in 3 dimensions with the $\begin{pmatrix} x \\ y \\ z \end{pmatrix}$ basis, we can find the angular momentum generator L about the x axis as,

- $\begin{pmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix}$
- $\begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$
- $\begin{pmatrix} 0 & 0 & 1 \\ 0 & 0 & 0 \\ -1 & 0 & 0 \end{pmatrix}$
- $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & -1 \\ 0 & 1 & 0 \end{pmatrix}$

2) A B $A+B$ ***1 point***

always

None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
iff A and B belong to Abelian group

3) The Jacobi identity to be obeyed by elements A, B, C satisfying a Lie Algebra is ***1 point***

$[A,[C,B]]+[B,[C,A]]+[C,[A,B]]=0$

$[A,[B,C]]+[B,[C,A]]+[C,[A,B]]=0$

$[A,[B,C]]+[B,[C,A]]+[C,[B,A]]=0$

$[A,[B,C]]+[B,[C,A]]+[C,[A,B]]=0$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$[A,[B,C]]+[B,[C,A]]+[C,[A,B]]=0$

4) The group manifold of 1 dimesional translations is ***1 point***

Real number axis $[-\infty,\infty]$

Real number axis $[-\infty,\infty)$

Real number axis $(-\infty,\infty)$

Real number axis $(-\infty,\infty]$

No, the answer is incorrect.
Score: 0

Accepted Answers:
Real number axis $(-\infty,\infty)$

5) Lorentz boosts and spatial rotations individually form -------- and --------- respectively. (Fill in the blanks) ***1 point***

Compact set, Non-compact group

Compact group, Compact group

Non-compact group, Non-compact set

Non-compact set, Compact group

No, the answer is incorrect.
Score: 0

Accepted Answers:
Non-compact set, Compact group

6) The number of generators of $SU(8)$ is ***1 point***

8

- 64
- 63
- 65

No, the answer is incorrect.
Score: 0

Accepted Answers:
63

7) Pauli matrices in 2 dimensional representation are **1 point**

- all real
- all traceless
- all complex
- all have determinant 1

No, the answer is incorrect.
Score: 0

Accepted Answers:
all traceless

8) A 1-Parameter subgroup of $GL(n,\mathbb{C})$ is a mapping $M:\mathbb{R}\to GL(n,\mathbb{C})$ which follows the property(ies) : **1 point**

- M is continuous
- $M(a+b)=M(a).M(b)$ as group multiplication
- $M(0)=\mathbb{I}_{n\times n}$
- All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of the above

9) The group manifold of $SO(3)$ is isomorphic to the topological space **1 point**

- S^1
- S^2
- $\mathbb{R}P^3\cong S^3/\mathbb{Z}_2$
- S^3

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\mathbb{R}P^3\cong S^3/\mathbb{Z}_2$

10)In Quantum Mechanics the wave function ψ once specified **1 point**

- is the unique description of that state of the system

- is one of an equivalence class of complex vectors describing the system
- only its real part is relevant to physics
- only its modulus remains relevant to Physics under all further experiments

No, the answer is incorrect.
Score: 0

Accepted Answers:
is one of an equivalence class of complex vectors describing the system

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