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NPTEL

Unit 13 - Week 12

Week 12-Assignment 12-MCQ

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment. **Due on 2018-10-24, 23:59 IST.**

1) In a universe free of electromagnetic interaction, how can one differentiate between a proton and a neutron (assuming their masses to be the same)? ***1 point***

- By their strong nuclear force
- By their intrinsic spin in the Stern-Gerlach experiment
- By their isotopic spin in a weak interaction experiment
- By the gravitational field of a black hole

No, the answer is incorrect.
Score: 0

Accepted Answers:
By their isotopic spin in a weak interaction experiment

2) The constituents of Baryons and Mesons are (where q's are the quarks and $\bar{q}$'s are the antiquarks) ***1 point***

- $q\bar{q}$ and qqq
- qqq and $q\bar{q}$
- qqq and qq
- qq and qqq

No, the answer is incorrect.
Score: 0

Accepted Answers:

12-Assignment 12-MCQ
Week12- Lecture Slides
Week 12-Assignment12- Solutions

- 9

No, the answer is incorrect.
Score: 0

Accepted Answers:
8

4) Ordinary Vectors are **1 point**

- tensors of rank 1
- tensors of rank 0
- tensors of rank 2
- not treated as tensors

No, the answer is incorrect.
Score: 0

Accepted Answers:
tensors of rank 1

5) The isotropy of space implies the conservation of **1 point**

- Linear Momentum
- Energy
- Angular Momentum
- Electric charge

No, the answer is incorrect.
Score: 0

Accepted Answers:
Angular Momentum

6) From the Gellmann-Nishijima formula, $Q = T_3 + \frac{Y}{2}$, find the hypercharge Y of proton. **1 point**

- 1
- 0
- -1
- $\frac{1}{2}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
1

7) The Hamiltonian and the Lagrangian are related through **1 point**

- Mobius transformation
- Fourier transformation
- Laplace transformation
- Legendre transformation

No, the answer is incorrect.
Score: 0

Accepted Answers:
Legendre transformation

8) Any gauge transformation can be treated as local if **1 point**

- the transformation parameter is spacetime dependent
- the transformation parameter is spacetime independent
- the transformation generator is spacetime dependent
- the transformation generator is spacetime independent

No, the answer is incorrect.
Score: 0

Accepted Answers:
the transformation parameter is spacetime dependent

9) In the presence of an electromagnetic field, the kinetic part $\frac{|\vec{p}|^2}{2m}$ of the Hamiltonian of a classical charged particle with mass m and charge q needs to be replaced by **1 point**

- 0
- $\frac{1}{2m}\left|\vec{p}-\frac{q}{c}\vec{A}\right|^2$
- $\frac{|\vec{p}|^2}{2m}$
- $\frac{1}{2m}\left|\frac{q}{c}\vec{A}\right|^2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{1}{2m}\left|\vec{p}-\frac{q}{c}\vec{A}\right|^2$

10) Homogeneity in time gives us the conservation of **1 point**

- Isotopic spin
- Angular momentum
- Linear momentum
- Energy

No, the answer is incorrect.
Score: 0

Accepted Answers:
Energy

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