Guidelines for admission Test in Ph.D. High Energy Physics, PU, Lahore

The Test shall be MCQ based and will include the fallowing major portions of Physics

- Mathematics (Quantitative skills, Vectors, Calculus, Complex Analysis, Linear vector spaces, Green functions, Fourier and Taylor Series)
- Quantum Mechanics
- Computational skills (understanding simple programs and algorithms)
- Electromagnetism (Law of electrostatics and magneto statics, and Maxwell's equations etc.) Classical Mechanics (including the Lagrangian and Hamiltonian formulations)
- Special Relativity
- Atomic and Nuclear Physics
- Statistical Physics
- Relativistic quantum mechanics
- Particles physics basics
- Lie groups
- Verbal reasoning (English)
- Analytical reasoning (Logical thinking)

The students may consult

1. "Calculus and Analytic Geometry" by G.B. Thomas and R.L. Finney,
2. "Mathematical Methods for Physicists", G. Arfken,
3. "Physics", by Halliday, Resnick and Krane,
4. "Perspectives of Modern Physics", by A. Beiser,
5. "Quantum Mechanics" by Zettili
6. "Mathematica for Scientists and Engineers" by Thomas B. Bander
7. "Classical Electrodynamics" by Griffith or Ritz
8. "Classical Mechanics" by T.L. Chnw,
9. "Statistical physics" by Reif
10. "Nuclear Physics" by Berchem or Williams
11. "Introduction to elementary particles" by David Griffiths
12. "Unitary symmetry and elementary particles" by Lichtenberg 11. "GAT General" Dogar Publisheres

Or other books of the similar standard and contents.

Sample Paper (2022) for the Admission Test for the Ph.D. Programme
Centre for High Energy Physics, Punjab University.

Note: The test shall be MCQ based with no negative Marking

Please chose the correct answer

A probability is

a) an integer times probability density
b) always half
c) an integral of probability density.
d) a derivative of the probability density

What is the rank of SU(5) group?

a) 1
b) 2
c) 3
d) 4
e) 5

In quantum mechanics, spin angular momentum is

a) a rotation in position
b) the matrix representation of angular momentum
c) a first derivative
d) always an integer.

If two observers are in relative motion, in general they _____ agree on whether two events at different location are simultaneous. If one observer finds the two events to be simultaneous, the other _____.

a) do , also does
b) do not , does not
c) do not , also does
d) do , does not

Eigenvectors of a Hermitian operator belonging to different eigenvalues are

a) orthogonal
b) not possible
c) not normalized
d) complex conjugates of each other

Identify the suitable option to complete the following sentence: Employers who hire retire people, willing and able to continue working, should realize that _____ age is not an effective _____ in determining whether an individual is capable of working.

a) intellectual – criterion
b) chronological – criterion
c) physical – barrier
d) deteriorating – value

Which one of the following sets corresponds to fundamental particles?

a) Proton, electron and neutron
b) Proton, electron and neutrino
c) Electron, photon and neutrino
d) Quark, electron and meson

Which equation does not produce free particle solution with negative energy?

a) Klein-Gordon equation
b) Dirac equation
c) Schrodinger equation
d) None

What will be the value of y at end of the statements: x=4; y=7;x=y-3; z=x+y; y=zy/x;

a) 77/4
b) 77/6
c) 77/5
d) 87/4