

Quiz

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March 2016

1 Questions Answers

1) What is the mass of a photon? Newton defined the "momentum" p of this particle (also a vector), such that p behaves in a simple way when the particle is accelerated, or when it's involved in a collision. For this simple behaviour to hold, it turns out that p must be proportional to v . The proportionality constant is called the particle's "mass" m , so that $p = mv$.

2) What is the size of a quark? Its size is $2.3 M_V V/c^2$

3) What is the difference between electrical charge and color charge? Electrical charge is the quantity of matter responsible for electrical phenomena carried by a particle. Color charge is a charge responsible for the strong force acting on quarks and anti-quarks.

4) Explain the difference between a boson and a fermion? A boson is any particle that has multiple versions of itself in the same quantum state where fermions are particles that can only have one state (spin) at a given moment.

5) Describe what type of particle is both a boson and a hadron. Give an example. Both Bosons and Hadrons are or is a Meson.

6) Explain the purpose of a bubble chamber. A Bubble chamber is designed to make the tracks of ionizing particles visible as a row of bubbles in a liquid.

7) What are leptons made of? Leptons are made out of charged leptons (live leptons), neutral leptons (neutrinos)

8) Name two leptons and two baryons. 2 Leptons: Muon, Tau
2 Baryons: Proton, Antiproton

9) Explain what quantities are conserved at each vertex of a Feynman diagram. 2 down vote The Feynman diagram is shown with time going up the y-axis. More commonly time is shown on the x-axis but it is not incorrect to put it on the y-axis so long as people notice.

The diagram shows the tree-level diagram for a negative electron annihilating a positive positron to produce two photons. Total charge is zero before and after so is conserved. The electron line is shown with an arrow that goes forward in time for the electron and backwards for the positron as if a positron is an electron going back in time. This was an interpretation that Feynman liked.

10) Explain what an "exchange particle" is. Describe its function and provide an example. The preferred meaning of exchange force is in particle physics, where it denotes a force produced by the exchange of force carrier particles, such as the electromagnetic force produced by the exchange of photons between electrons and the strong force produced by the exchange of gluons between quarks.