

Particle Physics for Non-Specialists (MSD 2019/2020) Exam

(no formulas needed, few sentences, **very general**)

1. What are generations of quark and leptons?
2. Differences between virtual and real particles.
3. How modern accelerators work?
4. Describe one detector - explain how it works.
5. What you are doing when you draw and evaluate a Feynman diagram.
6. Describe shortly electromagnetic interactions.
7. Describe shortly weak interactions.
8. Describe shortly strong interactions.
9. What is Higgs boson?
10. Example of 1-2 symmetries in Particle Physics. What is consequence of asking for local gauge invariance?
11. What is quark confinement and asymptotic freedom? What are jets?
12. Compare behaviour of EM and Strong running coupling constants.
13. Problems of Standard Model. Give few examples of what it does not explain.
14. What is Supersymmetry? Why it is super? :)
15. Neutrinos - short description of why are difficult to detect and examples for their sources. Evidence for their mass.