

The following questions will have 4 multi-choice responses.

You will have up to 3 hours to answer. You will not have any access to books or internet.

1. The probability of observing a particular event in quantum mechanics is given by
2. Bose-Einstein condensation of liquid Helium suddenly leads to
3. Which of the following is *impossible* in Special Relativity?
4. Which of the following is necessary laser operation?
5. What is the probability of rolling two dice and getting a total of 9?
6. Which of the following is *not* evidence for the correctness of General Relativity?
7. In which case would two observers *necessarily* agree about the simultaneity of two events?
8. According to General Relativity, which of the following did *not* begin with the Big Bang?
9. Which kind of photon has the least energy?
10. The patterns observed when two light waves combine are called
11. Which of the following is not a direct application of Quantum Mechanics to technology?
12. The Copenhagen Interpretation of Quantum mechanics questions objective reality because
13. Why does an interference pattern disappear if the photons' path is observed?
14. Where are the electrons in the atom that govern the chemistry of an element?
15. Which of the following pair of quantities can Heisenberg's uncertainty principle refer to?
16. Electron microscopes can be used to see more detail than with visible light because
17. The name given to the central part of an atom is
18. Which of these is *not* an application of radioactivity?
19. Atoms are stable because
20. What do spectral lines signify?
21. Which atom is the simplest?
22. Which scientist's equation describes the movement of quantum probability waves?
23. What are the smallest features that a Scanning Tunneling Microscope can see?
24. Energy released in a typical nuclear weapon is converted from roughly how much mass?
25. What does the acronym LASER stand for?
26. Which of the following would indicate *random* error in an experiment?
27. In Feynman diagrams, positive energy anti-particles going forwards in time are understood as
28. Which scientists first performed an artificial nuclear reaction?
29. Which particles are found in an atomic nucleus?
30. Which type of nuclear reaction involves smaller nuclei combining to make bigger nuclei?
31. According to the Copenhagen Interpretation, before one looks in the box, Schrodinger's cat is
32. Which of the following is *not* an interpretation of the Quantum measurement problem?
33. Fermion particles of the same type are such that
34. The basic vertex in any QED space-time Feynman diagram involves
35. Which form of radioactivity typically has the shortest range?
36. Which of the following is *not* a force-carrier particle?
37. The amount of naturally-occurring antimatter observed in the universe is
38. Quark confinement is a property of which force of nature?
39. Which of the following is *not* a consequence of combining relativity and quantum mechanics?
40. Which of these is evidence for Dark Matter?