

# 45 Lecture - PHY101

## Important Subjective

**What is the uncertainty principle in quantum mechanics?**

**Answer:** The uncertainty principle in quantum mechanics states that it is impossible to simultaneously determine certain pairs of physical properties, such as position and momentum, with arbitrary precision.

**What is a wave function in quantum mechanics?**

**Answer:** A wave function in quantum mechanics is a mathematical function that describes the behavior of a quantum system. It is used to calculate the probability of finding a particle in a particular state.

**What is the difference between a classical and a quantum system?**

**Answer:** A classical system is one that follows classical mechanics, which describes the behavior of macroscopic objects. A quantum system, on the other hand, follows quantum mechanics, which describes the behavior of microscopic objects such as atoms and subatomic particles.

**What is the Schrödinger equation?**

**Answer:** The Schrödinger equation is a fundamental equation in quantum mechanics that describes the evolution of a wave function over time. It is used to predict the behavior of a quantum system.

**What is quantum entanglement?**

**Answer:** Quantum entanglement is a phenomenon in which the properties of two or more particles become correlated in such a way that the state of one particle cannot be described independently of the other particles.

**What is a quantum state?**

**Answer:** A quantum state is a mathematical description of the state of a quantum system. It includes information about the properties of the system, such as its energy, momentum, and spin.

**What is a quantum superposition?**

**Answer:** A quantum superposition is a state in which a quantum system can exist in multiple states simultaneously. For example, an electron can be in a superposition of spin-up and spin-down states.

**What is a quantum measurement?**

**Answer:** A quantum measurement is a process by which the properties of a quantum system are observed. When a quantum system is measured, its wave function collapses to a single state, and the properties of the system are determined with a certain probability.

**What is quantum tunneling?**

**Answer:** Quantum tunneling is a quantum mechanical phenomenon in which a particle can pass through a potential barrier even if its energy is less than the height of the barrier. This is due to the wave-like nature of the particle.

**What is the Heisenberg uncertainty principle?**

**Answer:** The Heisenberg uncertainty principle is a fundamental principle in quantum mechanics that states that the more precisely the position of a particle is known, the less precisely its momentum can be known, and vice versa. This principle sets a fundamental limit on the precision with which certain pairs of physical properties can be determined.