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Crash Course Physics #44: Quantum Mechanics – Part 2

Name: _____ Date: _____

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1. The idea that matter can behave like both a particle and a wave is known as - _____.
2. Louis de Broglie proposed that all _____ has a wave associated with it.
3. The _____ is the pattern created when waves interfere after passing through slits.
4. The wavelength of matter is equal to Planck's constant divided by its _____.
5. The experiment that showed electrons interfering with themselves used a _____ setup.
6. The wavelength of large, visible objects is _____ small to detect.
7. Quantum mechanics often deals in terms of _____, rather than certainties.
8. The _____ is the mathematical equation that predicts the behavior of quantum systems.
9. The _____ tells us where we are most likely to find a particle in space.
10. A quantum _____ refers to an object existing in multiple states or locations at once.
11. When a quantum system is measured, its wavefunction _____ to a single outcome.
12. The _____ states there's a limit to how precisely we can know both position and momentum.
13. Describing particles as a collection of waves is known as using a _____.
14. The minimum uncertainty is equal to Planck's constant divided by _____ times pi.
15. Quantum mechanics is necessary because it accurately describes the behavior of _____ particles.

Crash Course Physics #44: Quantum Mechanics – Part 2 KEY

1. The idea that matter can behave like both a particle and a wave is known as **wave-particle duality**.
2. Louis de Broglie proposed that all **matter** has a wave associated with it.
3. The **diffraction pattern** is the pattern created when waves interfere after passing through slits.
4. The wavelength of matter is equal to Planck's constant divided by its **momentum**.
5. The experiment that showed electrons interfering with themselves used a **double slit** setup.
6. The wavelength of large, visible objects is **incredibly** small to detect.
7. Quantum mechanics often deals in terms of **probability**, rather than certainties.
8. The **Schrödinger equation** is the mathematical equation that predicts the behavior of quantum systems.
9. The **probability density function** tells us where we are most likely to find a particle in space.
10. A quantum **superposition** refers to an object existing in multiple states or locations at once.
11. When a quantum system is measured, its wavefunction **collapses** to a single outcome.
12. The **Heisenberg Uncertainty Principle** states there's a limit to how precisely we can know both position and momentum.
13. Describing particles as a collection of waves is known as using a **wave packet**.
14. The minimum uncertainty is equal to Planck's constant divided by **4** times pi.
15. Quantum mechanics is necessary because it accurately describes the behavior of **tiny** particles.

15 Questions

Answer Key Included

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