15.9: End of Chapter Key Terms

Definition: Key Terms

1. Source Charge: A charge that produces an electromagnetic wave when it is oscillated.
2. Amplitude: The strength of the electric field.
3. Wavelength: The distance between maximum electric field locations.
4. Frequency: The number of oscillations per second completed by the source charge.
5. Wave Speed: The rate at which electromagnetic energy propagates. In vacuum this is the speed of light: $3x10^8$ meters per second.
6. Wave Interference: When two or more waves combine to create a larger or smaller wave.
7. Intensity: The power delivered by a wave per unit of area.
8. Radiation Pressure: The force per unit area delivered by an electromagnetic wave.
9. Electromagnetic Spectrum: The range of frequencies and wavelengths that encompass electromagnetic waves.
10. Infrared Light: Wavelengths of light longer than red light.
11. Ultraviolet Light: Wavelengths of light shorter than violet light.
12. Photoreceptors: Light sensing cells in the retina of human eyes.
13. True Color: The color of an object when illuminated by white light.
14. Retinex: A collection of photoreceptors in the retina.
15. Color Constancy: The ability of the eye to perceive true colors under a variety of lighting.
16. Wien's Law: An experimental relationship between temperature of an object and the wavelength of light it emits.
17. Ultraviolet Catastrophe: The failure of the electromagnetic wave model to recreate Wien's Law.
18. Quanta: The smallest bit of energy possible in Planck's Hypothesis.
19. Quantized Energy: The idea that all energy must be a multiple of a fundamental value.
20. Energy State: A way to describe the value of the energy associated with a particular object.
21. Quantum Number: A number that is used to multiply the quanta to obtain the energy state.
22. Photoelectrons: Electrons ejected from surfaces when light shines upon them.
23. Photoelectric Effect: The relationship between the wavelength of light and the appearance of photoelectrons.
24. **Electromagnetic Radiation**: Waves of electric and magnetic fields that propagate through space.
25. Photon: The smallest unit of an electromagnetic wave in the particle model of light.
26. Gain Medium: The part of a laser that produces the laser light.
27. Metastable State: A condition where excited electrons remain in an excited state for some period of time.
28. Population Inversion: When there are more electrons in an excited state than in lower energy states.
29. Laser Pumping: The process of transferring energy from the power supply to the gain medium.
30. Optical Resonator: A component of a laser that traps and amplifies electromagnetic radiation before it is released as a beam.
31. Particle-WAve Duality: The concept that objects display both wave-like and particle-like properties.
32. **Quantum Mechanics**: The branch of physics that studies the behavior of particles on the atomic and subatomic level.

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