Topic 12 - Quantum Physics

#	Physical Quantity	Definition
1	**Wave-particle Duality**	" Is the phenomenon that allows waves to behave like particles and particles to behave like waves depending on how they are observed."
2	**The Photoelectric Effect**	" Is the emission of electrons from a metallic surface when light or other forms of electromagnetic radiation are incident on the surface."
3	**Threshold or Critical Frequency**	" Is the minimum frequency of light required to liberate an electron from the surface of a metal."
4	**Work Function, Φ**	" Is the minimum amount of energy needed to completely free an electron from the photo-surface."
5	**Stopping Voltage**	" Is the voltage at which the current becomes zero and the kinetic energy of the emitted electrons is maximum."
6	**Quantum Efficiency**	" Is the fraction of photons that eject electrons out of photo-surface at a certain wavelength."
7	**The de Broglie Hypothesis**	" There is a wave-like nature associated with every moving particle, of wavelength equals to Planck's constant divided by the momentum of the particle."
8	**Angular Momentum, mvr**	" Is the vector product of the momentum of a particle (mv) and the radius of the motion r."
9	**Bohr's First Assumption**	" The angular momentum (mvr) of an electron in a stationary state on a stable orbit is quantized in integral values of h/2π."
10	**Schrodinger's Model**	" States that the square of the wave function of a particle at any point determines the probability of finding it there."
11	**Wave Function**	" Is the wave that gives the probability per unit volume of finding an electron at a point in space at a given time."
12	**The Uncertainty Principle**	" Heisenberg proposed that it is not possible to precisely define the position and momentum of a particle at the same time."
13	**Tunnelling**	" Is a quantum mechanical phenomenon in which particles can be transmitted through energy barriers. That would classically be impossible due to energy conservation."
14	**Annihilation**	" When a particle meets its anti-particle they annihilate forming two photons."
15	**Pair Production**	" When a photon has enough energy to create a particle and its antiparticle."
16	**The Decay Constant, λ**	" Is defined as the probability that a nucleus will decay in a unit of time."
17	**Activity**	" Is the number of nuclei decaying in a sample of N nuclei in one second, and has the unit becquerel, Bq."
18	**Deep Inelastic Scattering**	" Is a phenomenon by which new particles are created when electrons are moving close to the speed of light, they collide with the nucleus and dislodge quarks from the protons and neutrons."