

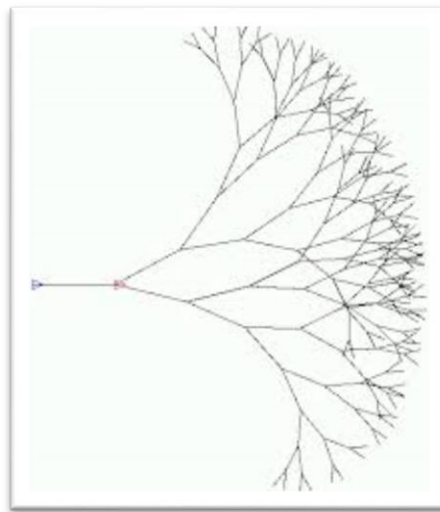
WEEK 1

ASSIGNMENT

Many World Interpretation

The Many-Worlds Interpretation of quantum mechanics in simple words states that many worlds exist in parallel at the same space and time as our own.

Explanation:



When an object's wave function is measured, it can be either a particle or a wave. On measurement, it is not forced into one state, instead, measurement of a quantum object causes an actual split in the universe. Each of the universes will have the possible outcomes of the measurement. It can also be said that each universe is as real as the other.

So a scientist in one universe finds that the object has been measured in wave form. The same scientist in the other universe measures the object as a particle. The final superposition is actually there but they can't interact with each other; what happens in one branch has no effect on what happens in the other. This is because they are separate, equally real worlds as stated before.

Basically, a measurement is any interaction that causes a quantum system to become entangled with the environment, it creates a branching into separate worlds, and an observer is any system that brings about such an interaction. Consciousness has nothing to do with it.

The many-world interpretation of quantum mechanics is a **non-deterministic** approach.

Explanation:



Let us use the case of Schrodinger's Cat, in which we have a cat inside a sealed box in a quantum superposition of alive and dead. Textbook quantum mechanics says that on opening the box and observing the cat, it collapses the wave function into one of two possible measurement outcomes, alive or dead. Everett, by contrast, says that the universe splits in two: in one the cat is alive, and in the other the cat is dead. Once split, the universes go their own ways, never to interact with each other again. Therefore, it is a non-deterministic approach.