**Quiz 1:**

1. **Quantum Computing** means what?

**Speed.**

1. List **4 Components of IOT**:

* Sensors
* Network
* Cloud/AI
* Application

1. List **3 components of** **Smart X(device):**

* IP address
* OS (Operating System)
* AI (Artificial Intelligence)

1. List **3 types of AI**:

* Narrow AI (Intelligence: **Human > AI**)
* General AI (Intelligence: **Human = AI**)
* Smart AI (Intelligence: **Human < AI**)

1. Fish Tank? What happened?

* A model with some weather detailing gadget tank set at the entrance of the Hotel. In past, it was the victim of a Cyber-Attack, where the attack was on the system database where all sensitive information got leaked with customer’s personal details and situations went worse.

1. What is **Blockchain in one word**?

* Gossip / Network

1. What is **Ransomware**?

* A malware which has been spread out via online platformes and corrupt the user data with malicious virus. It’s spreadable via the activities on malicious page, email or any source.

1. Explain **Quantum Computing to average person**?

* Quantum Computing is speed. Quantum computing operations are performed on Quantum theories/physics except classical physics. It provides parallel multi-states processing for the computing activities.

**Quiz 2:**

1. List **4 Components of IOT**:
2. What is **Quantum Physics**?

Unlike classical physics, **in quantum physics**, even if you have full knowledge of a system, the **outcomes of certain measurements will be impossible to predict**.

1. What is **Quantum Mechanics**?

* **Quantum Mechanics** is the branch of physics that **deals with the behaviour of matter and light on a subatomic and atomic level**.
* It attempts to explain the properties of atoms and molecules and their fundamental particles like protons, neutrons, electronics, and quarks.

1. What is **Quantum Computing**?

* **Quantum Computing** isthe **area of study** focused **on developing computer technology** based on the principles of quantum theory.
* The quantum computer, following the laws of **quantum physics**, would gain enormous processing power through the ability to be in multiple states, and to perform tasks using all possible permutations simultaneously.

1. What do you **need to learn Quantum (3 items)**?

* Physics
* Mathematics
* Programming

1. **List 3 top companies** in Quantum Computing:

* **IBM**
* **Microsoft**
* **Google**

**Quiz 3:**

1. List **3 programming Languages** of QC

* **QCL**
* **QMASM**
* **Silq**

1. List **3 difficult facing** QC?

* Interference
* Error Correction
* Output observance

1. List **2 difference between Qubits and Bits**?

BITs Qubits

Classical Computer – operations on BITs Quantum Computer – operations on Quantum Bits (Qubits)

0 or 1 at a time 0 and 1 at the same time (Superposition)

Used in sequential Classical calculations Used in parallel Quantum calculations

1. List all the **layers of QC Model**:

* Physical Qubit Hardware
* Quantum Firmware: Hardware Error Mitigation
* Hardware-Aware Quantum Computer
* Quantum Error Correction
* Logical-Level Compilation & Circuit Optimization
* Quantum Algorithms & Applications
* User Interface, QAAS, & Operating System

1. What are the **two main principles of QC**?

* Superposition:
  + According to quantum law, the particle enters a **superposition** of states, in which it behaves as if it were in both states simultaneously. Each utilized qubit could take a superposition of both 0 and 1.
* Entanglement:
  + Particles that have interacted at some point retain a type of connection and can be entangled with each other in pairs, in a process known as correlation.
  + Knowing the spin-state of one entangled particle – **up or down** – **allows one to know** that the spin state of its mate is in the opposite direction.
  + Quantum entanglement allows qubits that are separated by incredible distance to interact with each other instantaneously.

**Quiz 5:**

1. In your own words, explain “**Schrodinger’s cat**”

Schrodinger’s cat is a though experiment devised by the physicist Erwin Schrodinger, which he designed to illustrate a paradox of quantum superpositionwherein a hypothetical cat **may be considered both alive and dead** simultaneously because its fate is linked to a random event that may occur.

The experiment states that the hypothetical cat is locked in a box with some radioactive substance controlling a vial of poison. When the substance decays, it triggers a Geiger counter that causes the poison to be released, thereby killing the cat.

In Quantum mechanics terms, the cat’s ability to be in an ambiguous state of both alive and dead until it’s observed (i.e. when someone opens the box) is referred to as **the observer’s paradox.**

1. In your own words, explain “Shor’s Algorithm”

* Shor’s algorithm works by using the principles of quantum mechanics to **perform certain calculations much more quickly than is possible** **with a classical computer**.
* Specifically, it uses the principles of **quantum parallelism** and **quantum interference** to **find the prime factors of a given integer** in a fraction of the time that would be required by a classical computer.

1. In your own words, explain “RSA Algorithm”

RSA is an **asymmetric encryption algorithm** that is widely used in many products and services.

(Asymmetric encryption **uses a key pair** that is mathematically linked **to encrypt and decrypt data**. A private and public key are created, with the **public key being accessible** to anyone and the **private key** being a secret **known only by the key pair creator.)**

* With RSA, **either the private key or public key** can encrypt the data, while the other key decrypts it. This is one of the reasons RSA is the most used asymmetric encryption algorithm.
* The option to encrypt with either the private or public key provides a multitude of services to RSA users.

1. What are the vulnerabilities of RSA?

* **Implementation of a long key** in the encryption algorithm
* RSA relies on the size of the its key to be difficult to break
* **Weak Random-number generator**
* **Weak Key generation**
* **Side Channel attacks**

1. List 7 layers of OSI Model? And what are the 3 functions of Presentation layer in OSI model?

**Layers of OSI model:**

* **P**hysical layer
* **D**ata Link layer
* **N**etwork Layer
* **T**ransport Layer
* **S**ession Layer
* **P**resentation Layer
* **A**pplication Layer

3 functions of presentation layer:

* Encrypt
* Compress
* Transport