This is the first in series of **practice tests** / **interview questions and answers** in relation to **Quantum computing**. It touches upon the basic concepts in relation to some of the following:

* Qubit
* Difference between a bit and Qubit
* Superposition of Qubit states
* Quantum entanglement

This practice test will prove to be useful for **Quantum Computing beginners / interns / freshers.**

**Revision Notes – Quantum Computing Fundamentals**

1. Quantum computing is different than classical computing. Problems which are suited for quantum computing should be considered for Quantum computing.
2. A Qubit is a two-state quantum mechanical system;
3. A Qubit can be in **superposition** of both the states at the same time.
4. A Qubit is similar to bit in the way that the measurement of Qubit has two possible outcomes, usually 0 and 1
5. A Qubit is different than bit in the way that a Qubit can be in a state which is a superposition of both 0 and 1
6. The two states in which a qubit may be measured are known as basis states (basis vectors)
7. In quantum mechanics, the **Bloch sphere** is a geometrical representation of the pure state space of a 2-level quantum system. The Bloch sphere is actually, geometrically, spherical in shape.
8. A Quantum logic gate can operate on a Qubit.
9. 8 Qubits = 1 Qubyte (**Quantum Byte**)
10. A Qubit can be measured with quantum register
11. A Qubit is different than bit due to following reasons:
    1. -It can have superposition of states, e.g., can be in both states (usually 0 and 1) at the same time.
    2. -Can be entangled with other Qubit
12. In case of 2-qubit system, it is not possible to determine state of individual qubit in the system as the states of the two qubits are **entangled**

**1.**

**Quantum computing is \_\_\_\_\_\_\_\_\_ than classical computing**

Faster

Different

**2.**

**A Qubit is a \_\_\_\_\_\_\_\_\_ quantum mechanical system.**

2-state

3-state

4-state

**3.**

**A Qubit can be in \_\_\_\_\_\_\_\_\_\_ of both the states at the same time**

Entanglement

Superposition

**4.**

**Unlike a bit, the measurement of Qubit can have more than two possible outcomes**

True

False

**5.**

**Unlike a bit, the Qubit can be in both 0 and 1 state (superposition of both 0 and 1 states)**

True

False

**6.**

**The two states in which a qubit may be measured are known as \_\_\_\_\_\_\_\_**

Basis states

Basis vectors

Both of the above

**7.**

**Which of the following shape can be used to the pure state space of a 2-level quantum system?**

Rectangle

Cylinder

Sphere

Cube

**8.**

**Which of the following can operate on a Qubit?**

Classical logic gate

Quantum logic gate

Both of the above

**9.**

**8 \_\_\_\_\_\_\_ is to 1 \_\_\_\_\_\_ as 8 \_\_\_\_\_\_\_ is to 1 \_\_\_\_\_\_\_\_**

Qubits, Qubyte, Bits, Byte

Qubits, Byte, Bits, Qubyte

Bits, Qubyte, Qubits, Byte

**10.**

**The amount of information stored in N Qubits is \_\_\_\_\_\_\_\_ to the power of N classical bits**

Two

Three

Four

**11.**

**A Qubit can be used to represent any \_\_\_\_\_\_\_\_ system**

Two-level

Three-level

None of the above

**12.**

**A Qubit can be measured with \_\_\_\_\_\_\_\_\_\_ register.**

Classical

Quantum

Both of the above

**13.**

**Which of the following makes Qubit different than a classical bit?**

Superposition of states

Entanglement

Both of the above

**14.**

**In case of 2-qubit system, it is possible to determine state of individual qubit in the system.**

True

False