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Assignment 5

Ans-1-

classical Bits.	Quantum Bits.
1) The device computes by manipulating those bits with the help of logical gates. (AND, OR, NOT).	1) The device computes by manipulating those bits with the help of Quantum logic gates.
2) A classical computer has a memory made up of bits where each bit holds either a 1 or 0.	2) A Quantum bits can holds a 1 or 0, or classically a superposition of these.
3) Bits are used in classical computers.	3) Quantum bits are use in quantum.
4) Information is stored in bits.	4) Information is stored in quantum bits or q bits.
5) Bits are slow.	5) Quantum bits are faster

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Ans-2- Given,

$$|\psi| = \frac{1}{\sqrt{5}}|u_1\rangle - i\sqrt{\frac{7}{15}}|u_2\rangle + \frac{1}{\sqrt{3}}|u_3\rangle$$

for Normalization $\langle\psi|\psi|\rangle = 1$

$$\Rightarrow \frac{1}{5}\langle u_1|u_1\rangle + \frac{7}{15}\langle u_2|u_2\rangle + \frac{1}{3}\langle u_3|u_3\rangle$$

$$\Rightarrow \frac{1}{5} + \frac{7}{15} + \frac{1}{3} \Rightarrow \frac{15}{15} = 1$$

Thus, $|\psi\rangle$ is normalized.

Ans-3- Surface to volume ratio: The amount of surface area per unit volume of an object or collection of objects. It refers to amount of surface a structure has relative to its size.

Quantum confinement: It is the spatial confinement of electron-hole pairs in one or more dimension within a material and also electronic energy levels are discrete.