

B.TECH.
(SEM VII) THEORY EXAMINATION 2022-23
QUANTUM COMPUTING

Time: 3 Hours**Total Marks: 100****Note:** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A**

- 1. Attempt all questions in brief. 2 x 10 = 20**
- Who is the father of Quantum Computing?
 - How Bit is different from Qubit?
 - Are Quantum gates Reversible or Irreversible?
 - What are the conditions for Quantum Computation?
 - What is Nuclear Magnetic Resonance?
 - Can Quantum computers become Self aware?
 - Write any One characteristic of Markov Process.
 - Write any 3 Quantum Operations.
 - Is Shannon entropy positive or negative?
 - Define Shor Code.

SECTION B

- 2. Attempt any three of the following: 10x3 = 30**
- Why are we so interested in Quantum Computers and Quantum Simulators in current time-period?
 - What hurdles do researches face in developing a Quantum Computer?
 - What is entanglement in Quantum Computing?
 - What is quantum electrodynamics? Why it is important in Quantum computing?
 - With the help of an example explain error correction with reference to Quantum Computing.

SECTION C

- 3. Attempt any one part of the following: 10x1 = 10**
- What are the 3 key attributes to measure the performance of Quantum Computers?
 - Differentiate between classical computing and Quantum computing.
- 4. Attempt any one part of the following: 10x1 = 10**
- What are the Universal Quantum Gates? Explain in detail.
 - Is there any application for why to search through an unstructured database, the average number of check is $N/2$ in classical computation?
- 5. Attempt any one part of the following: 10x1 = 10**
- How do Photon Quantum Computers work?
 - What are the 3 types of Quantum Computer? Explain in detail.
- 6. Attempt any one part of the following: 10x1 = 10**
- What types of problem are best suited for Quantum Computing?
 - How does Quantum Noise appear on a digital image? Explain in detail.
- 7. Attempt any one part of the following: 10x1 = 10**
- What is Quantum error correction code? Explain.
 - What is Stabilizer Code?