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Roll No

CS - 8304**B.E. VIII Semester**

Examination, June 2015

Quantum Computing*Time : Three Hours***Maximum Marks : 70****Note:** Attempt all questions. Each question carry equal marks.

1. a) Explain Qubit and Quantum states. What is the difference between bit and Qubit? 7
- b) Explain an Universal quantum Gates? Differentiate between quantum Gates and Universal classical logic gates? 7

OR

2. Explain the following: 14
 - i) Matrices and operators
 - ii) Single and multiple Qubit Gates

3. a) Explain the term measurement and unitary evolution with respect to quantum theory concept. 7
- b) Explain the problems to be considered during the measurement. 7

OR

4. a) What is superposition of states? What is its significance in measuring the average value and standard deviation of an observable? 7

- b) Explain the density operator for pure and mixed state. 7

5. a) Explain the term quantum entanglement? 7
- b) Explain entanglement swapping. 7

OR

6. a) Explain Nuclear Magnetic Resonance. 7
- b) Explain the applications of entanglement in teleportation. 7

7. a) Explain the quantum Fourier transform circuit. 7
- b) Explain the quantum algorithm for factoring a number. 7

OR

8. Explain the following: **RGPVONLINE.COM** 14
 - a) Quantum searching and Grover's Algorithm.
 - b) Quantum parallelism and function Evaluation.

9. Explain the following: (any four) 14
 - i) Fault tolerant quantum computation
 - ii) Theory of quantum error correction
 - iii) Shannon Entropy
 - iv) Data compression
 - v) Properties of Entropy.