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: 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.