

Time: 3 Hours

Max. Marks: 80

Instructions:

- i. Question 1 is compulsory.
- ii. Solve any three from remaining.

Q1.

- A How does Quantum computing differ from Traditional Computing? (10)
- B What is Quantum Teleportation? (10)

Q2.

- A Explain in detail the Circle Notation for Multi-Qubit Registers. (10)
- B What are the various Quantum state transformations? (10)

Q3.

- A Write a brief note on Orthogonal Projectors and Orthonormal Bases. (10)
- B Explain the Linear Algebra Formulation of the Circuit Model. (10)

Q4.

- A Discuss Quantum Gates. (10)
- B Explain the addition of two quantum numbers in Quantum Arithmetic. (10)

Q5.

- A Write a short note on Quantum Arithmetic. (10)
- B Discuss the General Quantum Operations. (10)

Q6.

- A Discuss Matrix Encodings in Quantum Computing and how can QPU Operations be used to represent a matrix. (10)
- B Explain how a QPU can be used in Conventional Super sampling. (10)
