

Duration: 3 hrs

[Marks: 80]

- N.B. :** (1) Question No 1 is Compulsory.  
(2) Attempt any three questions out of the remaining five.  
(3) All questions carry equal marks.  
(4) Assume suitable data, if required, and state it clearly.

- 1 Attempt any **FOUR** [20]
- a Explain artificial atoms with respect to circuit QED.
  - b What are Pauli matrices.
  - c Explain bell states.
  - d Explain artificial atoms with respect to circuit QED.
  - e Explain eigenvalues and eigenvectors.
- 2 a State and prove spectral decomposition theorem. [10]
- b Elaborate major contributions of D-Wave in Quantum Computing. [10]
- 3 a Explain the 3 qubit code with respect to Quantum error correction. [10]
- b Explain Quantum entanglement with necessary diagrams. [10]
- 4 a Explain Deutsch-Jozsa algorithm with necessary diagrams and equations. [10]
- b Explain in detail No Cloning theorem. [10]
- 5 a How is Qiskit used for quantum programing? [10]
- b Explain Quantum LC Circuits with necessary diagrams and equations. [10]
- 6 a What are the features of the Microsoft Quantum development kit? [10]
- b Elaborate major contributions of Rigetti in Quantum Computing. [10]
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