

Code No.: R22CS58233PE

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CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I–M.TECH–II–Semester End Examinations (Supply) – February 2026
QUANTUM COMPUTING (PE-III)
(CSE)

[Time: 3 Hours]

[Max. Marks: 60]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 10 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(10 Marks)

1. a) What is quantum computing? [1M]
- b) Define classical logic bit. [1M]
- c) What is Entanglement in quantum computing? [1M]
- d) Write about super-symmetry. [1M]
- e) Give an example of multiple Qubit gate. [1M]
- f) Write an example of quantum circuit [1M]
- g) State the relation between quantum and classical complexity classes. [1M]
- h) Write statement of Shor's factorization algorithm. [1M]
- i) Discuss about quantum error correction. [1M]
- j) Define quantum cryptography. [1M]

PART-B

(50 Marks)

2. Distinguish between Classical and Quantum logical operations. [10M]
- OR**
3. Explain in detail about Qubits with an example. [10M]
4. Write short note on the following
 - a) Paul's exclusion principle. [3M]
 - b) Superposition principle. [3M]
 - c) Density operators and correlation. [4M]
- OR**
5. Illustrate the basics of quantum mechanics. [10M]
6. Design quantum circuits with an example. [10M]
- OR**
7. Discuss about Bloch spheres and Bell states in quantum computing. [10M]
8. Implement the basic steps of Deutsch's algorithm with an example. [10M]
- OR**
9. Implement the basic steps of Grover's search algorithm with an example. [10M]
10. Compare between classical and quantum information theory. [10M]
- OR**
11. Discuss briefly about quantum teleportation. [10M]
