Code No.: R22CS58233PE | R22 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I–M.TECH–II–Semester End Examinations (Regular) – September- 2023
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 are the three concepts in Quantum Computing?	[1M]
b)	List the principle of Quantum Computing.	[1M]
c)	What is use of Linear Algebra in Quantum Computing?	[1M]
d)	List the two applications of Hilbert space.	[1M]
e)	What is a Qubit in Quantum Computing?	[1M]
f)	List the two uses of Quantum Circuits.	[1M]
g)	What was the first Quantum Algorithm?	[1M]
h)	Write the relationship between the Quantum and Classical Complexity classes.	[1M]
i)	List the two types of the Quantization errors.	[1M]
j)	Define Quantum Cryptography.	[1M]

PART-B **(50 Marks)**

2.	Explain the importance of the Mathematics and Physics in Quantum Computing.	[10M]
	OR	
3.	Discuss the Classical Vs. Quantum logical operations.	[10M]
4.	Difference between Real space and Hilbert space.	[10M]
	OR	
5.	Explain the Genomics and Proteomics.	[10M]
6.	Discuss the Physical implementation of the Qubit.	[10M]
	OR	
7.	Describe the multiple Qubit gates.	[10M]
8.	What is the complexity of the Deutsch Algorithm? Explain.	[10M]
	OR	
9.	How does Grover's search algorithm work? Explain.	[10M]
10.	Discuss the Quantum Teleportation with examples.	[10M]
	OR	
11.	Explain the Graph states and codes with examples.	[10M]

****