

Total No. of Questions : 8]

SEAT No. :

PE2435

[Total No. of Pages : 2

[6584]-385

**B.E. (Artificial Intelligence and Data Science)**  
**QUANTUMARTIFICIALINTELLIGENCE**

**(2019 Pattern) (Semester - VII) (417523A) (Elective - III)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data if necessary.

- Q1)** a) Discuss factoring integers with example. [6]  
b) Describe Simon's algorithm with example. [6]  
c) Compare Deutsch algorithm and Deutsch-Jozsa algorithm. [6]

OR

- Q2)** a) Discuss the working of Shor's algorithm with its significance in breaking classical cryptosystems. [6]  
b) Discuss how Grover's algorithm is used in searching in unsorted databases? [6]  
c) Write a short note on Phase Kick-Back and its usage. [6]

- Q3)** a) Discuss regression with example. [6]  
b) Write a note on variational quantum algorithms. [6]  
c) Discuss quantum neural network in detail with small example. [6]

OR

- Q4)** a) Describe quantum machine learning classification with appropriate example. [6]  
b) Discuss quantum algorithms for linear algebra. [6]  
c) Elaborate the steps for nearest neighbour search with example. [6]

*P.T.O.*

- Q5)** a) Discuss in detail quantum cryptography. [6]  
b) Write a short note on Fault Tolerance. [5]  
c) Explain quantum dense coding. [6]

OR

- Q6)** a) Discuss the concept of quantum teleportation and its significance in quantum communication. [6]  
b) Describe with appropriate steps quantum key distribution process. [6]  
c) Write a note on classical three bit code. [5]

- Q7)** a) Discuss penny lane a cross platform python library. [6]  
b) Write a note on Quantum search. [5]  
c) Elaborate tarrataca's quantum production system. [6]

OR

- Q8)** a) Discuss quantum neural computations with its significance. [6]  
b) Enlist and discuss challenges and limitations associated with quantum computing utilised in Data Science. [6]  
c) Write a Note on Quantum walk. [5]

