Here are the **2 marks questions** for the provided topics:

Mathematics and Vectors

1. **State the difference between positive numbers and natural numbers.**
    - **Positive numbers** include all numbers greater than zero, while **natural numbers** are the set of positive integers starting from 1 (1, 2, 3, ...).
2. **What do you understand by imaginary number?**
    - An **imaginary number** is a number that, when squared, gives a negative result. It is expressed as a real number multiplied by **i**, where **$i = \sqrt{-1}$**.
3. **What is the value of i^3?**
    - The value of **i^3** is **-i**.
4. **What is complex number?**
    - A **complex number** is a number of the form **a + bi**, where **a** is the real part and **b** is the imaginary part.
5. **What do you understand by field?**
    - A **field** is a set with two operations, addition and multiplication, where every non-zero element has a multiplicative inverse, and both operations are commutative and associative.
6. **When a field can be called algebraically complete?**
    - A field is **algebraically complete** if every non-constant polynomial with coefficients in the field has a root in the field.
7. **How you can change the sign of a complex number?**
    - To change the sign of a complex number **a + bi**, multiply it by **-1**, resulting in **-a - bi**.
8. **What is conjugation?**
    - **Conjugation** of a complex number involves changing the sign of its imaginary part. The conjugate of **a + bi** is **a - bi**.
9. **What do you understand by complex conjugate?**
    - The **complex conjugate** of a complex number **a + bi** is **a - bi**.
10. **Write C^4 zero vectors.**
    - The **zero vector** in **C^4** is **(0, 0, 0, 0)**.
11. **What can be called as an inverse of a vector?**
    - The **inverse** of a vector **v** is **-v**, where each component of **v** is negated.
12. **What is abelian group?**

- An **abelian group** is a group in which the operation is commutative, meaning **a + b = b + a** for all elements **a** and **b** in the group.

13. **What is Hermitian matrix?**
    - A **Hermitian matrix** is a square matrix that is equal to its own conjugate transpose, i.e., $\mathbf{A = A^{+}}$.
14. **What is unitary matrix?**
    - A **unitary matrix** is a square matrix whose inverse is equal to its conjugate transpose, i.e., $\mathbf{A^{-1} = A^{+}}$.
15. **What is bit?**
    - A **bit** (binary digit) is the smallest unit of data in computing, representing either **0** or **1**.
16. **What is qubit?**
    - A **qubit** (quantum bit) is the basic unit of quantum information, capable of being in a state of **0**, **1**, or a superposition of both.
17. **What is qubyte?**
    - A **qubyte** is a unit of quantum information that consists of **8 qubits**.
18. **What are the basic logic gates?**
    - The basic **logic gates** are **AND**, **OR**, **NOT**, **NAND**, **NOR**, **XOR**, and **XNOR**.
19. **What are the universal logic gates?**
    - The **universal logic gates** are **NAND** and **NOR**, as any other gate can be constructed using only these.
20. **What is quantum gate?**
    - A **quantum gate** is a fundamental operation in quantum computing that manipulates qubits, similar to how classical gates manipulate bits.
21. **What is encryption?**
    - **Encryption** is the process of converting plaintext into ciphertext using an algorithm and a key to secure information.
22. **What is decryption?**
    - **Decryption** is the process of converting ciphertext back into plaintext using an algorithm and a key.
23. **What is ciphertext?**
    - **Ciphertext** is the encrypted form of data, unreadable without decryption.
24. **What is eavesdropping?**

- **Eavesdropping** is the act of secretly listening to or intercepting communications, often with malicious intent.

25. **What does the term superposition refer to?**
    - **Superposition** in quantum mechanics refers to a qubit being in a combination of both **0** and **1** states simultaneously.
26. **How is a qubit in quantum computing different from a regular bit in classical computing?**
    - A **qubit** can be in multiple states at once (superposition), whereas a **bit** can only be in one state at a time (**0** or **1**).
27. **In quantum computing, what is the basic unit of information?**
    - The basic unit of information in quantum computing is a **qubit**.
28. **Which part of the drug discovery life cycle can quantum computing impact the most?**
    - Quantum computing can have the most impact on **molecular modeling** and **drug design**, speeding up simulations of complex molecules.
29. **What does it mean when we say that we are currently in the noisy, intermediate scale quantum computing stage?**
    - It means quantum computers are in the stage where they are still prone to errors, and their capabilities are not yet scalable for large problems.
30. **What is the purpose of "post-quantum" cryptography?**
    - **Post-quantum cryptography** aims to develop cryptographic algorithms that are secure against quantum computing attacks.

Let me know if you need more questions from the list or further clarifications!