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**BENGALURU**  
**School of Computer Science and Engineering**  
**Mid - Term Examinations - November 2024**

**Semester:** III

**Date:** 05-11-2024

**Course Code:** CSE2019

**Time:** 09.30am to 11.00am

**Course Name:** Foundations of Block chain Technology

**Max Marks:** 50

**Program:** B. Tech

**Weightage:** 25%

**Instructions:**

*(i) Read all questions carefully and answer accordingly.*

*(ii) Do not write anything on the question paper other than roll number.*

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**Part A**

**Answer ALL the Questions. Each question carries 2marks.**

**5Qx2M=10M**

- |          |  |         |    |     |
|----------|--|---------|----|-----|
| <b>1</b> | List two features of blockchain technology   | 2 Marks | L2 | CO1 |
| <b>2</b> | Differentiate between Public blockchain and Private blockchain.                          | 2 Marks | L2 | CO1 |
| <b>3</b> | Name two tiers of blockchain technology and state their differences?                     | 2 Marks | L1 | CO1 |
| <b>4</b> | Differentiate between Proof of Work (PoW) and Proof of Stake (PoS) consensus mechanisms. | 2 Marks | L2 | CO2 |
| <b>5</b> | Define consensus mechanisms in a blockchain network.                                     | 2 Marks | L1 | CO2 |

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**Part B**

**Answer ALL Questions. Each question carries 10 marks.**

**4QX10M=40M**

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|-----------|-----------|--|--------|----|-----|
| <b>6</b>  | <b>a.</b> | Explain in detail distributed ledgers and explain their significance in blockchain technology? | 5Marks | L1 | CO1 |
|           | <b>b.</b> | Describe the main phases in the lifecycle of a blockchain transaction.                         | 5Marks | L2 | CO1 |
| <b>or</b> |           |  |        |    |     |
| <b>7</b>  | <b>a.</b> | List the primary components that make up a block in a blockchain.                              | 5Marks | L1 | CO1 |
|           | <b>b.</b> | Describe what a block in a blockchain typically contains.                                      | 5Marks | L2 | CO1 |

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|----------|---|--------|----|-----|
| <b>8</b> | <b>a.</b> Discuss the consensus mechanisms commonly used in blockchains with an example | 7Marks | L1 | CO2 |
|          | <b>b.</b> Compare Proof of Work (PoW) and Delegated Proof of Stake (DPoS).              | 3Marks | L2 | CO2 |

**Or**

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|----------|---|--------|----|-----|
| <b>9</b> | <b>a.</b> Discuss how the consensus mechanism in blockchain technology prevents double-spending issues. | 7Marks | L1 | CO2 |
|          | <b>b.</b> Explain the concept of consensus mechanisms in distributed systems.                           | 3Marks | L2 | CO2 |

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|-----------|---|--------|----|-----|
| <b>10</b> | <b>a.</b> List the primary components of a blockchain.                        | 4Marks | L1 | CO1 |
|           | <b>b.</b> Describe the role of a cryptographic hash function in a blockchain. | 6Marks | L2 | CO1 |

**Or**

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|-----------|--|--------|----|-----|
| <b>11</b> | <b>a.</b> Name the different types of blockchain.  | 4Marks | L1 | CO1 |
|           | <b>b.</b> List the primary features of blockchain. | 6Marks | L1 | CO1 |

- |           |  |         |    |     |
|-----------|--|---------|----|-----|
| <b>12</b> | Analyze how hybrid consensus mechanisms combine different approaches to achieve scalability and security in blockchain networks. Provide examples of such hybrid mechanisms. | 10Marks | L2 | CO2 |
|-----------|--|---------|----|-----|

**Or**

- |           |   |         |    |     |
|-----------|---|---------|----|-----|
| <b>13</b> | Explain how the Practical Byzantine Fault Tolerance (PBFT) algorithm ensures consensus in a network with faulty or malicious nodes. | 10Marks | L2 | CO2 |
|-----------|---|---------|----|-----|