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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations – JANUARY 2025** |
| **Date:** 04 - 01- 2025 **Time:** 09:30 am – 12:30 pm |

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| **School:** SOCSE | **Program:** B.Tech CBC | |
| **Course Code:** CSE3022 | **Course Name:** Cryptocurrency Technology | |
| **Semester**: VII | **Max Marks**: 100 | **Weightage**: 50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **24** | **24** | **26** | **26** | **-** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Answer ALL the Questions. 10 x 2 Marks =20 Marks** | | | | |
| **1** | What is a cryptographic hash function? | **2 Marks** | **L1** | **CO1** |
| **2** | Explain the concept of virtual mining in Peercoin. | **2 Marks** | **L2** | **CO2** |
| **3** | Show the structure of a Bitcoin block? | **2 Marks** | **L1** | **CO3** |
| **4** | What is smart property in blockchain technology? | **2 Marks** | **L1** | **CO4** |
| **5** | Define digital signatures and state their purpose. | **2 Marks** | **L1** | **CO1** |
| **6** | What is ASIC-resistant mining? | **2 Marks** | **L1** | **CO2** |
| **7** | What is Chaum’s blind signature? | **2 Marks** | **L1** | **CO3** |
| **8** | What is the purpose of a public randomness source? | **2 Marks** | **L1** | **CO4** |
| **9** | List the differences between hot and cold storage in cryptocurrency. | **2 Marks** | **L1** | **CO3** |
| **10** | Define escrow transaction. | **2 Marks** | **L1** | **CO4** |

**Part B**

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| **Answer the Questions Total 80 Marks.** | | | | | |
| **11.** | **a.**  **b.** | Summarize the advantages of cryptographic hash functions for ensuring data integrity in blockchains.  Demonstrate how digital signatures are applied in securing blockchain networks. Use relevant examples. | **10 Marks**  **10 Marks** | **L2**  **L2** | **CO1** |
| **or** | | | | | |
| **12.** | **a.**  **b.** | Explain the structure and purpose of Merkle Trees in verifying blockchain transactions.  Illustrate the use of append-only ledgers in maintaining an immutable blockchain. | **10 Marks**  **10 Marks** | **L2**  **L2** | **CO1** |
|  |  |  |  |  |  |
| **13.** | **a.**  **b.** | Describe the concept of virtual mining in Peercoin and its benefits.  Apply the idea of distributed consensus to a hypothetical cryptocurrency network. | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO2** |
| **or** | | | | | |
| **14.** | **a.**  **b.** | Explain the challenges addressed by ASIC-resistant mining in cryptocurrency networks.  Utilize cryptographic keys to illustrate how identities are established in Bitcoin. | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO2** |

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| **15.** | **a.**  **b.** | Summarize how network-layer de-anonymization compromises user privacy in Bitcoin.  Identify the methods by which decentralized mixing enhances privacy in cryptocurrency transactions. | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO3** |
| **Or** | | | | | |
| **16.** | **a.**  **b.** | Explain how proof of liabilities ensures transparency in cryptocurrency exchanges.  Apply Chaum’s blind signatures to a real-world scenario involving secure digital payments. | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO3** |

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| **17.** | **a.**  **b.** | Describe the significance of smart property in blockchain-based systems.  Identify strategies for enabling efficient micropayments using blockchain. | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO4** |
| **Or** | | | | | |
| **18.** | **a.**  **b.** | Explain the importance of escrow transactions in securing blockchain-based trade.  Apply the concept of green addresses to improve trust in cryptocurrency payments. | **10 Marks**  **10 Marks** | **L2**  **L3** | **CO4** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***