| Roll No. | | | | | | | | | | | | |
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# PRESIDENCY UNIVERSITY

**BENGALURU**

## Mid - Term Examinations – October 2025

**Date:** 11-10-2025 **Time:** 09.30am to 11.00am

| | | |
|---|---|---|
| **School:** SOCSE | **Program:** B. Tech | |
| **Course Code :** CBC2502 | **Course Name:** Distributed Ledger Technologies | |
| **Semester**: V | **Max Marks**: 50 | **Weightage**: 25 % |

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

**Instructions:**

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

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

## Part A

**Answer ALL the Questions. Each question carries 2marks.** **5Q x 2M=10M**

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|---|---|---|---|---|
| **1** | How Blockchain differ from Distributed Ledger Technologies? | **2 Marks** | **L1** | **CO1** |
| **2** | Define Hash function and give examples of hash used in block chain. | **2 Marks** | **L1** | **CO1** |
| **3** | Explain the structure of a Merkle tree with the help of a diagram. | **2 Marks** | **L2** | **CO1** |
| **4** | How do Permissioned and Permissionless Distributed Ledger Technologies differ? Explain with suitable examples. | **2 Marks** | **L2** | **CO2** |
| **5** | List the different consensus protocols used in Distributed Ledger Technologies. | **2 Marks** | **L1** | **CO2** |

## Part B

**Answer the Questions.** **Total Marks 40M**

| | | | | | |
|---|---|---|---|---|---|
| **6.** | **a.** | Apply your knowledge to illustrate a Block with its features and types, and demonstrate the Merkle tree structure with an example. | **10 Marks** | **L3** | **CO1** |
| | | **Or** | | | |

| | | | | | |
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| **7.** | **a.** | Demonstrate your understanding of Distributed Ledger Technologies (DLT) by illustrating its features and types with suitable real-world examples. | **10 Marks** | **L3** | **CO1** |

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|---|---|---|---|---|---|
| **8.** | **a.** | Compare the role of cryptographic primitives in blockchain by examining Hash functions and Digital Signatures, highlighting their similarities, differences, and use cases with suitable examples. | **10 Marks** | **L4** | **CO1** |
| | | **Or** | | | |
| **9.** | **a.** | Analyze the role of cryptographic primitives in blockchain by comparing Hash functions and Public Key Cryptography, and evaluate their significance with suitable examples. | **10 Marks** | **L4** | **CO1** |

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|---|---|---|---|---|---|
| **10.** | **a.** | Illustrate with suitable examples the application of consensus protocol following four rules for a single node in permissioned blockchains. | **10 Marks** | **L3** | **CO2** |
| | | **Or** | | | |
| **11.** | **a.** | Demonstrate how consensus mechanisms are applied in permissioned blockchains with suitable examples. | **10 Marks** | **L3** | **CO2** |

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|---|---|---|---|---|---|
| **12.** | **a.** | Describe how Proof of Stake (PoS), Delegated Proof of Stake (DPoS), and Practical Byzantine Fault Tolerance (PBFT) consensus algorithms select a miner for the next block generation. | **10 Marks** | **L2** | **CO2** |
| | | **Or** | | | |
| **13.** | **a.** | How do Proof of Work (PoW), Proof of Burn (PoB), and Proof of Elapsed Time (PoET) consensus algorithms function to select a miner for the next block generation? Explain with suitable interpretation. | **10 Marks** | **L2** | **CO2** |