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Bengaluru

Mid Term Examinations - October 2026

Date: 07/10/2026 **Time:** 11:45 AM - 01:15 PM

Course Code: CBC3402 **Course Name:** Bitcoin and Ethereum Protocols

Semester: Seventh Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2	CO3	CO4
Marks	20	8	60	2

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	What is the UTXO model in Bitcoin?	2	CO2	BT1
2	What is Nakamoto Consensus?	2	CO2	BT1
3	What is Solidity and what is its role in the Ethereum ecosystem?	2	CO2	BT1
4	What is Gas in Ethereum and why is it necessary?	2	CO2	BT1
5	Define Proof-of-Work (PoW) and its role in Bitcoin.	2	CO4	BT3

PART B : Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
6	Provide a comprehensive architectural breakdown of the UTXO (Unspent Transaction Output) model. Compare it with traditional balance-based accounting systems.	10	CO3	BT1
7	Detail the exact structure of a Bitcoin block header and payload. Explain how each field in the block header guarantees integrity.	10	CO3	BT1

PART C: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
8	Differentiate between Pay-to-Public-Key-Hash (P2PKH) and Pay-to-Script-Hash (P2SH).	10	CO1	BT1
9	Differentiate between ECDSA and SHA-256.	10	CO1	BT1

PART D: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
10	Detail the differences between call, delegatecall, and staticcall low-level execution primitives in Solidity and EVM.	10	CO3	BT3
11	Explain the cryptographic structure and operation of the Modified Merkle Patricia Trie (MPT) used in Ethereum.	10	CO3	BT3

PART E: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT

12	Explain the technical implementation of Bitcoin's Difficulty Adjustment Algorithm. Provide the mathematical formula and discuss edge cases like hash rate surges or drops.	10	CO3	BT3
13	Explain the concept of Segregated Witness (SegWit - BIP 141). Analyze how it solves transaction malleability and expands block capacity.	10	CO3	BT3