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# B.M.S. College of Engineering, Bengaluru-560019

**Autonomous Institute Affiliated to VTU**

## September / October 2023 Supplementary Examinations

**Programme: B.E.** **Semester: VII**
**Branch: Computer Science And Engineering** **Duration: 3 hrs.**
**Course Code: 21CS7PEBLC** **Max Marks: 100**
**Course: Blockchain**

**Instructions**: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may suitably assumed.





### UNIT - I

| | | | |
|---|---|---|---|
| 1 | a) | What is Byzantine fault tolerance? How is it relevant to Blockchain? | **8** |
| | b) | Explain the three properties of cryptographic hash functions. | **6** |
| | c) | Demonstrate the steps in creating digital signature using the Elliptic Curve Digital signature algorithm. | **6** |

### UNIT - II

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|---|---|---|---|
| 2 | a) | Illustrate Merkle tree visualization with a neat diagram and explain it's relevance to Blockchain. | **10** |
| | b) | Bring out the differences between hard fork versus soft fork and illustrate the same with an example. | **10** |

**OR**

| | | | |
|---|---|---|---|
| 3 | a) | Compare and list the differences as well as the similarities between private and public blockchain. | **6** |
| | b) | Illustrate with an example the complete lifecycle of a transaction in a Blockchain application. | **8** |
| | c) | Discuss the advantages of Blockchain over the conventional distributed systems. | **6** |

### UNIT - III

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|---|---|---|---|
| 4 | a) | Illustrate the execution environment of Ethereum Virtual Machine (EVM) with a neat diagram. | **10** |
| | b) | Design a smart contract for the following scenario:<br>A bidding application where everyone can send their bids during a bidding period. The bids include sending money / ether in order to bind the bidders to their bid. If the highest bid is raised, the previously highest bidder gets his/her money back. | **10** |

**OR**

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|---|---|---|---|
| 5 | a) | Design a smart contract illustrating different methods to send ether from one account to another in solidity. | **10** |

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|---|---|---|---|
| | b) | Explain any one vulnerability and demonstrate with an example one attack on the vulnerability. | **10** |

**UNIT - IV**

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|---|---|---|---|
| 6 | a) | Illustrate with a neat diagram the process of consensus mechanism using GHOST. | **8** |
| | b) | Discuss the applications of Blockchain in the field of Medical Record Management System. | **6** |
| | c) | Illustrate the Bitcoin consensus algorithm which is not vulnerable to Sybil attacks. | **6** |

**UNIT - V**

| | | | |
|---|---|---|---|
| 7 | a) | Explain Nakamoto consensus where the leader is elected and proposes a final value. | **8** |
| | b) | Differentiate between Proof of Work and Proof of Stake. | **6** |
| | c) | Show how the high energy consumption in Proof of Work is overcome using Proof of Burn. | **6** |

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