VIT
Vellore Institute of Technology

Final Assessment Test – April 2025

Course: **BCSE324L - Foundations of Blockchain Technology**

Class NBR(s): **2004/2012/6627** Slot: **F1+TF1**

Time: **Three Hours** Max. Marks: **100**

- **KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE**
- **DON'T WRITE ANYTHING ON THE QUESTION PAPER**

Answer ALL Questions
(10 X 10 = 100 Marks)

1. Explain the role of consensus in Blockchain Technology. Mention the key characteristics of Proof of Work (PoW). How does PoW work?

2. Hybrid Consensus Mechanisms (HCMs) are pivotal in enhancing the security and efficiency of Blockchain networks. Explain how PoW and PoS can be combined to provide an efficient and secure HCM in Blockchain? Mention few advantages of HCM?

3. Bring out the key differences between Blockchain and Distributed Ledger Technology. When should you use Blockchain over other Digital Ledger Technologies?

4. What is the purpose of Keys and Addresses in Ethereum Blockchain and how are they generated? Explain the different types of transactions in Ethereum Ecosystem?

5.a) Differentiate Traditional Contracts and Smart Contracts. Why are smart contracts useful? Explain how Blockchain is revolutionizing the Traditional Business Network.

OR

5.b) In Real Estate, Smart Contracts can simplify property transactions by automating the exchange titles. Design and implement a Smart Contract for the above scenario using solidity considering Property Registration, Property Transactions, and Lease Agreements focusing on security, transparency, and automation.

6. A global foundation is planning to build a DApp using Aragon for Social Good considering converting this foundation into an NGO at a later stage.

   Discuss how Aragon helps to set up a Decentralized Autonomous Organization, with significant modifications that allow new modus operandi from a foundation to NGO.

7. Explain the various steps in building Blockchain Ecosystem. Discuss various participants in the Blockchain ecosystem.

8. Despite the immense potential of Blockchain Ecosystems, several challenges and considerations must be addressed to ensure their widespread adoption and success. How do you address the challenges and considerations?

9. Discuss the role of Ethereum tokens in Decentralized Finance (DeFi) and gaming. How do these tokens enhance seamless transactions and providing liquidity in dApp's and what are the risk associated with each of them?

10.a) A Nation's Department of Energy (DoE) has some of the world's largest High-Performance Computing (HPC) systems. Explain how Blockchain technology can be applied to record the provenance of information, to integrate as part of the computing systems, and to provide robust options in integrity checking.

OR

10.b) Explain the process of setting up a cluster on a distributed infrastructure, allowing for increased scalability, fault tolerance, and overall performance by distributing the workload across multiple machines, essentially creating a robust Blockchain network ready for operation.

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