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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (S,FE) (FT/WP) Examinations September 2026 (2019 Scheme)

Course Code: CST428
Course Name: BLOCKCHAIN TECHNOLOGIES

Max. Marks: 100 **Duration: 3 Hours**

PART A

Answer all questions, each carries 3 marks. Marks

1 Discuss the features of Elliptical Curve Cryptography and mention its use in blockchain. (3)

2 Demonstrate the working of Merkle tree with a suitable example. (3)

3 Differentiate Proof based and Fault Tolerant based consensus in Blockchain. (3)

4 Depict the various methods of decentralization in Blockchain. (3)

5 What are coinbase transactions? (3)

6 Explain the concept of blockchain-based digital identity cards. (3)

7 Differentiate Inbound and Outbound in Smart Contract with example. (3)

8 What is Double spending? How it is resolved in Bitcoin? (3)

9 Differentiate Externally owned and Contract account in Ethereum. (3)

10 Write a function in solidity that returns true when an event occurs. (3)

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

11 a) Alice wants to send Bob a message M=8 using RSA where Prime numbers chosen are 7 and 11 and public key of Alice is 17. Perform the encryption and decryption process in RSA. (7)

b) Illustrate the working of SHA256 algorithm and highlight its applications. (7)

OR

12 a) Explain Advanced Encryption Standard (AES) and its operations with the help of neat diagram. (7)

b) Elaborate the functioning of digital signatures with an example from real-world scenario. (7)

Module II

13 a) Explain the layered blockchain architecture with the help of a diagram. (7)

b) How does blockchain enable the decentralization of processing power? Describe the mechanism behind it. (7)

OR

14 a) Describe the structure of blockchain and elaborate the various types of blockchain. (7)

b) Discuss the role of consensus in blockchain technology and explain any three consensus algorithms. (7)

Module III

15 a) Illustrate the working of Crash Fault Tolerant Consensus algorithm that uses consensus over a value under unreliable communications and makes use of (2F + 1) processes to ensure fault tolerance in a network. (7)

b) Elaborate the concept of Proof of Stake (PoS) consensus algorithm and its types (7)

OR

16 a) Explain the working of the consensus algorithm designed to achieve consensus in the presence of Byzantine faults. (7)

b) What are the different tasks of a Bitcoin miner? Explain the mining algorithm used in Bitcoin with the help of a diagram. (7)

Module IV

17 a) Explain the generic data flow of Oracle in smart contracts. Describe any three types of Oracles used in blockchain to interact with the external world. (7)

b) How can Blockchain technology enhance healthcare, aligning with the sustainable development goals ? (7)

OR

18 a) Discuss the legal and ethical implications of Blockchain technology. (7)

b) In the context of advancing Artificial Intelligence, how does Blockchain technology serve as a pivotal enabler? (7)

Module V

19 a) Explain the EVM operation and block difficulty mechanism in Ethereum. (7)

b) Design a smart contract in solidity for Simple Open Auction system depicting the key functions and deployment methods. (7)

OR

20 a) Explain how transactions are processed in Ethereum. Briefly explain the concept of gas and how does it affect the transaction processing? (7)

b) Describe the features of solidity language and also demonstrate the working of function and inheritance in solidity language (7)

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