

Enrolment No. _____

NATIONAL FORENSIC SCIENCES UNIVERSITY

School of Cyber Security & Digital Forensics

M.Tech. AIDS Sem - II

Mid Semester Examination - March-2025

Subject Code: (CTMTAIDS SII P5 EL1)

Date: 17/03/2025

Subject Name: Blockchain Security & Investigation

Time: 11:00 AM to 12:30 AM

Total Marks: 50

Instructions:

1. **Make suitable assumptions wherever necessary.**
2. **Figures to the right indicate full marks.**

Q.1 Answer the following / Define the following

10 x 2

(Marks)=20

- i) Explain the concept of a Merkle Patricia Tree.
- ii) What is a blockchain transaction fee?
- iii) Define blockchain anonymity.
- iv) Differentiate between private and public blockchains.
- v) What does Nakamoto Consensus mean?
- vi) Define Proof of Work.
- vii) What is Proof of Stake?
- viii) Explain the concept of a Sybil attack.
- ix) What is the main purpose of a smart contract?
- x) Give an example of an alternate smart contracts.

Q.2 Answer the following questions in short (any 5)

4 x 5

(Marks)=20

- i) Explain the mining mechanism in blockchain networks.
- ii) Explain key differences between Ethereum and Bitcoin blockchain implementation.
- iii) Discuss the role of sidechains in blockchain applications.

iv) Discuss the Nakamoto Consensus and its role in achieving distributed consensus.

v) Explain the challenges and advantages of smart contract constructions.

vi) Discuss the usage of Proof of Work and Proof of Stake in mitigating security threats.

Q.3 Answer the following in detail (any 2)

2 x 5

i) Discuss applications of blockchain technology with real-world examples.

(Marks)=10

ii) Explain the construction and functionality of Naive chain.

iii) Explain the construction and functionality of Neo chain.