2511N856

Candidate's Seat No :_____

IMSc (CSF) (NEP) Sem.-5 Examination
DSC-M-ICSF-354T (EA)
Fundamental of SCADA & IOT
November-2025

Time : 2-00 Hours] **[Max. Marks : 50**

Question 1: Answer the following questions:

i. Discuss Machine-to-Machine (M2M) communication and its role within IoT ecosystems. 5 Marks

ii. Explain the simplified IoT architecture and how it supports device connectivity. 5 Marks

OR

i. Compare and contrast Fog, Edge, and Cloud computing in the context of IoT. 5 Marks

ii. Explain the role of sensors and actuators in IoT systems. 5 Marks

Question 2: Answer the following questions:

i. Describe the physical and MAC layers in IoT access technologies. 5 Marks

ii. Explain the features and applications of IEEE 802.11ah standard. 5 Marks

OR

i. Explain the network layer protocols used in IoT, focusing on IP versions. 5 Marks

ii. Explain the 6LoWPAN protocol and its role in IoT. 5 Marks

Question 3: Answer the following questions:

i. Define SCADA and explain its functional requirements. 5 Marks

ii. Explain the major applications of SCADA in industrial automation. 5 Marks

OR

i. Explain how communication networks are integrated into SCADA systems. 5 Marks

ii. Compare centralized vs distributed SCADA system designs. 5 Marks

Question 4: Answer the following questions:

i. Discuss the functions of Remote Terminal Units (RTUs) in SCADA systems. 5 Marks

ii. Explain the working and function of Intelligent Electronic Devices (IEDs). 5 Marks

OR

i. Explain the role of SCADA servers in data management and control. 5 Marks

ii. Explain the importance of communication networks in SCADA systems. 5 Marks

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Question 5: Attempt any ten out of twelve. 10 Marks

1. What is an actuator?
2. Name one key enabling technology for IoT.
3. Define the simplified IoT architecture.
4. What is Fog computing?
5. Name one IEEE standard used for IoT access.
6. What does LoRaWAN stand for?
7. Name one feature of IEEE 802.11ah
8. Define the hierarchical concept of SCADA.
9. State one industrial application of SCADA.
10. Name one communication component in SCADA.
11. Name one function of a Control Panel.
12. Define an RTU briefly.

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IMSc (CSF) (NEP) Sem.-5 Examination

DSC-M-ICSF-354T (EB)

Block Chain Technology

Time : 2-00 Hours] **November-2025** **[Max. Marks : 50**

Question 1: Answer the following questions:

i. What is the difference between Public, Private, and Consortium Blockchains? 5 Marks

ii. What are DApps (Decentralized Applications)? Give examples. 5 Marks

OR

i. Explain the concept of Digital Signature in Blockchain. 5 Marks

ii. Explain any two real-world applications of Blockchain. 5 Marks

Question 2: Answer the following questions:

i. Define cryptography. Explain its main objectives: confidentiality, integrity, authentication, and non-repudiation. 5 Marks

ii. Explain RSA algorithm and its working steps. 5 Marks

OR

i. Write a short note on hashing algorithms: MD5, SHA-1, and SHA-256. 5 Marks

ii. What are the applications of SHA algorithms in password storage, digital signatures, and blockchain? 5 Marks

Question 3: Answer the following questions:

i. Describe the working of Merkle Trees with an example. 5 Marks

ii. What is the Blockchain Technology Stack? Write its major layers. 5 Marks

OR

i. Compare Hyperledger and Multichain protocols. 5 Marks

ii. What are the benefits of Smart Contracts in business collaborations? 5 Marks

Question 4: Answer the following questions:

i. State any two differences between traditional business models and blockchain business models. 5 Marks

ii. Give two successful blockchain business model use cases. 5 Marks

OR

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i. Explain Blockchain-as-a-Service (BaaS) with examples. 5 Marks

ii. Why are blockchain business models important for organizations? 5 Marks

10 Marks

Question 5: Attempt any ten out of twelve.

1. Name any two objectives of cryptography.
2. Which hashing algorithm produces a 128-bit hash value?
3. Which cipher shifts each letter of plaintext by a fixed number?
4. Define modular arithmetic.
5. Which algorithm allows two parties to securely exchange a key over an insecure channel?
6. Which hashing algorithm is widely used in blockchain technology like Bitcoin?
7. Name the cipher that uses a 5x5 matrix of letters.
8. Which algorithm uses a pair of public and private keys?
9. What is the main purpose of encryption?
10. Which key is used for both encryption and decryption in symmetric cryptography?
11. What does SHA stand for?
12. Name one hashing algorithm that is no longer considered secure.

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