

TE sem VI CSE-IOT R-19 CScheme

Max. Marks: 80

Time: 3 Hrs

Note

- 1) Attempt any **Four** questions out of Six.
- 2) All question carries equal marks.
- 3) Illustrate your answers with neat sketches wherever necessary.
- 4) Figures to the right indicate full marks.
- 5) Assume suitable additional data, if necessary and clearly state it.
- 6) All sub-questions of the same question should be grouped together.

**Q.1 Solve any Four out of Six.**

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- A Illustrate the phases of ethical hacking with a practical example. How does each phase contribute to an organization's cyber defense?
- B What is footprinting in ethical hacking? Describe in detail active and passive footprinting methods with examples and tools.

**Q.2**

20

- A Explain the Phases of Penetration Testing. Why is reporting considered as important as actual testing?
- B Define Social Engineering. With the help of examples, explain how psychological manipulation is exploited in cyberattacks.

**Q.3**

20

- A Draw and explain the Digital Forensics Life Cycle. How does this life cycle ensure evidence integrity?
- B During an incident response, explain the Initial Response Strategy you would apply for a ransomware attack. Why is immediate containment critical?

**Q.4**

20

- A Compare Static and Live Data Acquisition methods. Discuss challenges faced during live acquisition with real-world examples.
- B What is a Forensic Duplicate? Explain how tools like FTK Imager and dd are used to create forensic images. How is the hash value significant?

**Q.5**

20

- A Describe the method to investigate Windows Registry and Event Log files during a forensic investigation. What types of evidence can be extracted?
- B What is Data Carving? Discuss the importance of data carving tools like Bulk Extractor in recovering deleted data during forensic analysis.

**Q.6**

20

- A What is the Chain of Custody in digital forensics? Provide a detailed sample form and explain how mishandling can affect legal proceedings.
- B Prepare a structured format for a Forensic Investigation Report based on a cyber fraud case. Highlight the do's and don'ts during report writing.

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## TE sem VI CSE (IOT) R-19 C scheme

(3 Hours)

[Total Marks: 80]

N.B.: (1) Question No.1 is Compulsory.

(2) Attempt any three questions from the remaining questions.

(3) Assume suitable data wherever required but justify the same.

(4) Figures to the right indicate full marks.

(5) Answer each new question to be started on a fresh page.

1. (a) How to declare variables in Typescript? differentiate between let and Var. (5)  
 (b) Describe Click Stream Analysis in brief. (5)  
 (c) Elaborate MEAN stack architecture. (5)  
 (d) Explain the features of MongoDB. (5)
2. (a) Explain how events are handled in Node.js with EventEmitter class. Write a suitable program for the same. (10)  
 (b) Illustrate the following term (10)  
 1.ng-app , 2.ng-init , 3. ng-model , 4. ng-bind , 5. ng-show in Angular JS with suitable example.
3. (a) Define Semantic Web. Explain in detail the components of the Semantic Web Stack. (10)  
 (b) Explain Express.js Cookies management with example. (10)
4. (a) Write a Typescript program to explain the concept of inheritance. (10)  
 (b) Construct a Simple application for AngularJs form Validation. it will check if an email is valid or not. Draw a mock UI of the Output. (10)
5. (a) Explain different methods available in the networking module of Node.js. (10)  
 (b) Implement CRUD Operations in MongoDB. (10)
6. (a) Explain REST API in detail. (10)  
 (b) State the significance of the Request Object in Express.js. Also, explain the different properties of Express.js Request Object. (10)

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TE sem VI CSE - IOT R-19 C scheme

Total Marks: 80

Time: 3 Hours

- N. B. 1. Question No. 1 is compulsory.  
2. Attempt any 3 from remaining questions.  
3. Assume suitable data if necessary and justify the assumptions.

4\*5=20

**Q. 1 Attempt Any Four**

1. What are the main components of a blockchain?
2. What are Bitcoin addresses and their role in transactions?
3. What is the role of Certificate Authority (CA) in Hyperledger Fabric?
4. What are the components of Ethereum architecture?
5. What are ERC20 tokens, and what are their key features?

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**Q. 2**

1. Describe the consensus mechanisms used in Hyperledger Fabric.
2. Explain the structure of a block in a blockchain.

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**Q. 3**

1. Explain how Bitcoin transactions are validated and recorded on the blockchain.
2. What are different types of cryptocurrencies, and how do they function?

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**Q. 4**

1. Explain Ethereum's end-to-end transaction process.
2. Explain the architecture of the Hyperledger Fabric framework.

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**Q. 5**

1. Explain the purpose of a Merkle Tree in blockchain and describe how it works.
2. Explain how Blockchain strengthens Cybersecurity. What are the limitations?

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**Q. 6**

1. Describe the Peer-to-Peer (P2P) network architecture of Bitcoin.
2. Explain the Ethereum Virtual Machine (EVM) and its role in smart contracts.



TE sem VI CSE (IOT) R-19 C scheme

(3 Hours)

Total Marks: 80

N.B.: (1) Question No.1 is compulsory.

(2) Attempt any three questions from the remaining five questions.

(3) Make suitable assumptions wherever necessary but justify your assumptions.

- Q.1 Solve any Four
- a. Explain Design principles of Firewall 05M
  - b. Discuss various attacks 05M
  - c. Explain Public Key Infrastructure. 05M
  - d. Discuss Virtual Private Network. 05M
  - e. Explain Keylogger 05M
  - f. Explain various NAC enforcement methods 05M

Q2.

- a. Use Affine cipher and perform encrypt and decryption, Plaintext "SECURITY with a key pair (5, 2). 10M
- b. Explain Kerberos with diagram. Discuss the technical deficiencies in Kerberos V4. 10M

Q3.

- a. Explain S/MIME for secure Email also list advantages and disadvantages. 10M
- b. Explain DOS and DDOS attacks with suitable example. 10M

Q4.

- a. What is Network Access Control? Discuss the element present in Network Access Control context. 10M
- b. Discuss characteristics of firewall. Compare packet filtering, stateful inspection, circuit gateway, application proxy firewall. 10M

Q5.

- a. Explain Advance Encryption Standard Algorithm with diagram also discuss various operations in AES. 10M
- b. Explain network management with respect to SNMP protocol also Compare SNMPv1, SNMPv2c and SNMPv3. 10M

Q6.

- a. Discuss various Monoalphabetic substitution cipher. Demonstrate Autokey cipher with suitable example. 10M
- b. Explain the Secure Socket Layer (SSL) protocol stack with a diagram and describe the various protocols used in SSL 10M

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TE sem VI CSE (IOT) R-19 scheme

[80 Marks]

[3 hrs]

- Note: 1. Question 1 is compulsory  
 2. Answer any three out of remaining questions  
 3. Assume suitable data where required

- Q1 Solve any 4 5
- Define Actuator and Sensor? State its role in IoT Ecosystem. 5
  - Discuss how low power consumption is essential for prolonging the life of battery-operated devices in IoT. 5
  - Briefly elaborate the MQTT (Message Queuing Telemetry Transport), 5
  - Explain physical design of IoT 5
  - Short note on OCTAVE 5
- Q2 10
- Discuss the significance of topology considerations in IoT communications. How does the choice of network topology impact scalability, reliability, and efficiency in IoT deployments? 10
  - Define Micro-Electro-Mechanical Systems (MEMS) and explain their significance in the development of smart objects. 10
- Q3 10
- Differentiate between fog computing and edge computing in the IoT context. 10
  - How data analytics is performed in IoT and mentioned its advantages 10
- Q4 10
- Examine the considerations for adopting or adapting the Internet Protocol in IoT applications. 10
  - Explain RFID working in detail 10
- Q5 10
- Explain the concepts of objective function rank, RPL headers, and metrics in the context of RPL. 10
  - Illustrate the Purdue Model for Control Hierarchy and its implications for security practices in OT. 10
- Q6 10
- Compare and contrast MQTT and CoAP protocols. Which one would you choose for a wearable health tracker, and why 10
  - Illustrate the Purdue Model for Control Hierarchy and its implications for security practices in OT. 10

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