

(3 Hours)

Total Marks : 80

INSTRUCTIONS

- (1) Question No. 1 is compulsory.
- (2) Attempt any (3) from remaining (5) questions.
- (3) Assume suitable data if required.
- (4) Figures to the right indicate full marks.

Q1 Attempt any four (4) questions.

- a) Explain different types of Blockchain. Give example of each. [5]
- b) What is Smart Contract? Explain different types of Smart Contracts. [5]
- c) Explain the concept of Ethereum Virtual Machine with suitable diagram? [5]
- d) With suitable diagram explain how transaction flow occurs in Hyperledger fabric? [5]
- e) What are different types of test-networks used in Ethereum? [5]

Q2 a) Explain the phases of development in ETH 2.0 with suitable diagram. [10]

- b) What are different steps involved in the implementation of Blockchain? [10]

Q3 a) Explain Bitcoin UTXO with suitable example. [10]

- b) Explain the RAFT consensus mechanism with suitable diagram. [10]

Q4 a) Explain Ethereum Accounts in detail. [10]

- b) How does Blockchain Supports Crowd Funding? [10]

Q5 a) What is Hyperledger Fabric? What are different components of Hyperledger Fabric? [10]

- b) What is Quorum Blockchain? Explain the structure of Quorum Node with suitable diagram. [10]

Q6 Write a short note on : [20]

- a) MetaMask
 - b) Mist Wallet
 - c) Ripple Blockchain.
 - d) Byzantine Fault Tolerant
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Duration: 3hrs

[Max Marks:80]

N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

- | | | |
|---|---|-----------|
| 1 | Attempt any FOUR | [20] |
| a | Describe services and mechanisms. | |
| b | ECB and CBC block cipher. | |
| c | Why digital signature and digital certificates are required? | |
| d | What is keyed and keyless transposition ciphers? | |
| e | Explain clickjacking and session hijacking. | |
| 2 | a Explain DES algorithm with reference to following points:
1. Block size and key size
2. Need of expansion permutation
3. Role of S-box
4. Possible attacks on DES
b Use the playfair cipher with the keyword “example” to encipher “The algorithm name is playfair cipher” | [10] [10] |
| 3 | a What are properties of hash function? Compare MD-5 and SHA hash algorithm.
b Explain Diffie hellman key exchange algorithm. | [10] [10] |
| 4 | a What do you understand by digital signatures and digital certificates? Explain digital signature scheme RSA.
b Explain memory and address protection in detail. Write a note on file protection. | [10] [10] |
| 5 | a Enlist various functions of protocols of SSL. Explain the phases of handshake protocol.
b Briefly explain database security. What do you understand by multilevel database security. | [10] [10] |
| 6 | Write short notes on any four : | [20] |
| a | Web browser attacks | |
| b | X.509 | |
| c | Cross site request forgery | |
| d | DNS attack | |
| e | Email attacks. | |

Duration: 3 Hrs

[Max Marks: 80]

- Notes: (1) Question No. 1 is Compulsory.
(2) Attempt any **THREE** questions out of the remaining **FIVE**.
(3) All questions carry equal marks.
(4) Assume suitable data, if required, and state it clearly.
(5) Figures to the right indicate full marks.

Q1	a)	What is an analytic sandbox, and why is it important?	5
	b)	Why use autocorrelation instead of autocovariance when examining stationary time series?	5
	c)	Difference between Pandas and NumPy.	5
	d)	What is regression? What is simple linear regression?	5
Q2	a)	Explain in detail how dirty data can be detected in the data exploration phase with visualizations.	10
	b)	List and explain methods that can be used for sentiment analysis.	10
Q3	a)	List and explain the main phases of the Data Analytics Lifecycle.	10
	b)	Describe how logistic regression can be used as a classifier.	10
Q4	a)	Suppose everyone who visits a retail website gets one promotional offer or no promotion at all. We want to see if making a promotional offer makes a difference. What statistical method would you recommend for this analysis?	10
	b)	List and explain the steps in the Text Analysis.	10
Q5	a)	How does the ARMA model differ from the ARIMA model? In what situation is the ARMA model appropriate?	10
	b)	Explain with suitable example how the Term Frequency and Inverse Document Frequency are used in information retrieval.	10
Q6	Write short notes on:		
	a)	Evaluating the Residuals in Linear regression.	5
	b)	Box-Jenkins Methodology	5
	c)	Seaborn Library.	5
	d)	Data import and Export in R	5

Time: 3 hours

Max. Marks: 80

Instructions:

- 1) Only **Four** question need to be solved.
- 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	(a) What are various issues in distributed system? Explain minimum 5 issues. Each issue carries 1 mark	05
	(b) Justify how Ricart-Agrawala's algorithm optimized the Message overhead in achieving mutual exclusion	05
	(c) What are desirable features of global scheduling algorithm.	05
	(d) Compare process and thread.	05
Q.2	(a) Explain the message communication model transient synchronous, transient asynchronous, persistent synchronous and persistent asynchronous in detail.	10
	(b) What is RPC? Explain the working of RPC in detail with the help of diagram.	10
Q.3	(a) Explain Suzuki-Kasami Broadcast Algorithm of mutual exclusion.	10
	(b) Explain the process of synchronization w.r.t. physical and logical clocks.	10
Q.4	(a) Compare Load sharing to Task Assignment and Load balancing strategies for scheduling processes in a distributed system.	10
	(b) Explain Bully Election algorithm with the help of an example.	10
Q.5	(a) Explain in detail different Data centric consistency models.	10
	(b) Explain Maekawa's algorithm in detail and also specify properties of Quorum Set.	10
Q.6	(a) Write a note on code migration.	10
	(b) What are the features of DFS and explain and draw and explain Model file service architecture.	10

(3 Hours)

(Maximum Marks: 80)

- NB.** 1. **Question number One** is compulsory
2. Attempt **any three out of remaining five** questions
3. Assume suitable data
4. Figures to the right indicate the maximum marks

- Q1** **Attempt any FOUR:** **(20)**
a) Define and classify Cybercrime
b) Comment on Windows OS Artifacts
c) Explain Principles of Digital Forensic.
d) Which are the Goals of Incident Response
e) How to Acquire Image over a Network
- Q2** a) Explain Digital Forensics and its lifecycle. **(10)**
b) Explain in detail Incidence Response Methodology **(10)**
- Q3** a) Describe Steps to prevent cybercrime and explain Hackers, Crackers and Phreakers **(10)**
b) Explain Forensic Investigation Report Writing in terms of Standards, Content, Style, Formatting and Organization. **(10)**
- Q4** a) Describe Digital Investigation Staircase Model **(10)**
b) How to Acquire an Image with dd Tools and with Forensic Formats **(10)**
- Q5** a) Describe in details OS File Systems. **(10)**
b) Explain Network-Based Evidence acquisition and its analyzing. **(10)**
- Q6** a) Explain Need and types of Computer Forensic Tools in detail. **(10)**
b) In Mobile Forensics explain Challenges, Evidence Extraction Process, Types of Investigation, and Procedure for Handling an Android Device. **(10)**

Time: 3 Hours

Max. Marks: 80

Note: 1. Q.1 is Compulsory.

2. Attempt any 3 from remaining
3. Assume suitable data if necessary

Q.1 Solve any Four

- A. What is Machine Learning? What are the steps in developing a machine learning application? [05]
- B. Differentiate between supervised and unsupervised learning. [05]
- C. Draw and explain biological neural networks and compare them with artificial neural networks. [05]
- D. Explain in detail the MP neuron model. [05]
- E. Explain the overfitting and underfitting with example [05]

Q.2

- A. Draw a block diagram of the Error Back Propagation Algorithm and explain with the flow chart the Error Back Propagation Concept. [10]
- B. The values of independent variable X and the dependent variable Y are given below

X	Y
0	2
1	3
2	5
3	4
4	6

Find the least square regression line $Y=aX+b$. Estimate the Y when the value of X equals 10. [10]

Q.3

- A. Diagonalize the matrix A

$$\begin{bmatrix} 2 & 2 \\ 1 & 3 \end{bmatrix}$$

[05]

- B. List out and explain the applications of SVD [05]
C. Write short note on maximum expectation algorithm [05]
D. What are Activation functions? Explain the Binary, Bipolar, Continuous, and Ramp activation functions. [05]

4.

- A. Write a short note on (a) Multivariate Regression and (b) Regularized Regression. [10]
B. What is the curse of Dimensionality? Explain the PCA dimensionality reduction technique in detail [10]

Q. 5

- A. Design a Hebb net to implement OR function (consider bipolar inputs and targets) [10]
B. Draw Delta Learning Rule (LMS-Widrow Hoff) model and explain it with a training process flowchart. [10]

Q. 6. Write short note on any FOUR

- A. Least Square Regression for classification [05]
B. Differentiate between Ridge and Lasso Regression [05]
C. Artificial Neural Network [05]
D. Feature selection methods for dimensionality reduction [05]
E. Perceptron Neural Network [05]
