Qp code : 10094958

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

(3 Hours) [Total Marks: 80]

N.B.

(1) Question No.1 is compulsory.
(2) Out of remaining attempt any three.
(3) Assume & mention suitable data wherever required.
(4) Figures to right indicates full marks

Q.1. Solve any four [20]

a) Explain the types of security services defined in the OSI Security Architecture and provide examples of each.
b) Explain what issteganography.
c) What is MD5 algorithm? Compare MD5 and SHA.
d) Explain the main features of the Data Encryption Standard (DES) and discuss its role in cryptography.
e) Explain the differences between symmetric and asymmetric encryption. Provide examples of algorithms used in each.

Q.2 [20]

a) What is a Man-in-the-Middle (MITM) attack? How can it be prevented in a secure network environment?

b) Explain the concept of Public Key Cryptography and its role in securing digital communication. Discuss how it differs from Symmetric Key Cryptography, and illustrate your answer with examples of real-world applications such as SSL/TLS or email encryption.

Q.3 [20]

a) A company experiences a Denial-of-Service (DoS) attack that disrupts its online services. Explain the nature of DoS attacks, how they differ from Distributed DoS (DDoS), and propose a multi-layered defense strategy to mitigate such threats. Include technical and organizational measures.

b) Describe the Diffie-Hellman Key Exchange protocol. Explain how it enables secure key exchange over an insecure channel and discuss potential vulnerabilities associated with this protocol.

Q.4 [20]

a) Explain the El-Gamal encryption algorithm, describing each step in the process of encryption and decryption. What are some practical applications and limitations of the El-Gamal algorithm?
b) Explain DES/ 2DES/ 3DES algorithm in brief

Q.5 **|20|**

a) Design a network security architecture for a medium-sized enterprise that includes firewalls, Intrusion Detection Systems (IDS), and VPNs. Explain how each component contributes to overall security and how they interact to detect and prevent threats.

b) Design a secure email communication system using cryptographic techniques. Explain how confidentiality, integrity, authentication, and non-repudiation can be achieved using tools like PGP, digital signatures, and certificates.

Q.6 Write short notes on **|20|**

a) How do digital signatures contribute to non-repudiation in electronic transactions?

b) Discuss the various user authentication methods used in operating systems. Compare the strengths and weaknesses of password-based authentication with biometric authentication.

c) Discuss the concept of multilevel database security. How does it differ from traditional database security measures, and what are its advantages in protecting classified information?

d) Describe the differences between SSL and HTTPS. How do these technologies work together to secure web communications?

e) Discuss Cross-Site Request Forgery (CSRF). How does it differ from Cross-Site Scripting (XSS), and what measures can developers implement to protect against CSRF attacks?

f) Define penetration testing. How does it contribute to improving the security posture of web applications? Discuss its importance in identifying vulnerabilities.

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TE - VI - AIML - R-19 QP : 10096096

Time: 3 hours **Max. Marks: 80**

N.B.: (1) Question No.1 is compulsory
(2) Attempt any three questions from remaining five questions.

Q1.		**Q1. Attempt any FOUR of the following: (5 marks each)**	**20**
	(a)	Define distributed system. List issues in designing distributed systems.	**5**
	(b)	Explain client–server model with an example.	**5**
	(c)	Differentiate between physical clock and logical clock.	**5**
	(d)	State features of process migration.	**5**
	(e)	Write short note on file caching schemes.	**5**
Q2.	(a)	Explain the working of the Raymond's tree-based algorithm for mutual exclusion	**10**
	(b)	Discuss the role of election algorithms in distributed systems	**10**
Q3.	(a)	Describe the Mackawa's algorithm for non-token-based mutual exclusion	**10**
	(b)	Explain the concept of distributed scheduling and its approaches.	**10**
Q4.	(a)	Explain Lamport's and Ricart–Agrawala's algorithm for mutual exclusion.	**10**
	(b)	Compare token-based and non-token-based mutual exclusion algorithms with performance analysis.	**10**
Q5.	(a)	Explain desirable features of global scheduling algorithm. Describe load balancing and load sharing approaches.	**10**
	(b)	Explain the concept of fault tolerance and process resilience in distributed systems	**10**
Q6.	(a)	Discuss the architecture and features of the Andrew File System (AFS)	**10**
	(b)	Explain the file accessing models used in distributed file systems.	**10**

TE - Sem-VI - CSE(AIML)-R-19 QP: 10095104

Duration: 3hours **[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 Compare supervised and unsupervised learning. Comment on Reinforcement learning. **[5]**

b Discuss overfitting and underfitting in Machine Learning models. How can they be controlled? **[5]**

c Explain the concept of eigenvalues, eigenvectors, and their importance in ML. **[5]**

d Explain the least squares method and its use in multivariate linear regression. **[5]**

e Explain the structure and working of an Artificial Neural Network. **[5]**

2 a What is the need for regularization? Explain Lasso and Ridge Regression techniques **[10]**

b Explain the concept of Support Vector Machines and discuss how SVMs perform classification. **[10]**

3 a A binary classifier is tested on 20 samples and produces following results for confusion matrix. Find Accuracy, Precision, Recall and F1 score. **[10]**

	Predicted: Positive	Predicted: Negative
Actual Positive	8	2
Actual Negative	1	9

b Find Eigen values and Eigen vectors for the following A= **[10]**

2	1
1	2

4 a What is Hebbian learning? Explain the Hebb design for AND gate **[10]**

b **[10]**

Student	Hours (x)	Marks (y)
1	2	81
2	4	93
3	6	91
4	8	97

Predict marks if student studies for 5 hours using linear regression.

5 a Explain the Backpropagation Algorithm for training a multilayer perceptron with necessary equations. **[10]**

b Describe logistic regression and explain how it differs from linear regression. **[10]**

6 a Describe the working of Principal Component Analysis (PCA) for dimensionality reduction. **[10]**

b Compare feature selection and feature extraction techniques. **[10]**

TE - Sem-VI - AIML - R-2019 QP:- 10098228

Max. Marks: 80

Time: 3 hours

N.B. (1) Question one is Compulsory.
(2) Attempt any 3 questions out of the remaining.
(3) Assume suitable data if required.

Q. 1 Answer any 4

a) Compare XP with Scrum model in agile software development. **05**

b) What is forward engineering and reverse engineering with respect to software reengineering. **05**

c) Explain functional and non-functional requirements with suitable examples. **05**

d) Define software quality. List any four quality attributes. **05**

e) Explain software maintenance and software supportability. **05**

Q. 2 a) Draw and explain the phases of the Project Life Cycle (PLC). Discuss how the PLC is related to the SDLC. **10**

b) Describe the different types of risks in software engineering with examples. For an e-commerce application, discuss any one risk in detail and outline steps to mitigate and manage it. **10**

Q.3 a) List and explain the major components of an SRS document for online examination system. **10**

b) Describe system testing and its types. How is it different from integration testing? **10**

Q.4 a) Your company is tasked with developing a College Admission Management System for a mid-sized university. The system will include features such as student registration, course enrollment, fee payment, exam scheduling, and report generation. The estimated size of the project is 50,000 lines of code (LOC).
The project is classified as an Organic mode, Estimate effort and time using COCOMO II Model. **10**

b) Explain any two in detail. **10**

i) PMBOK Knowledge areas.

ii) PERT and CPM

iii) W5HH principle

Q. 5 a)Explain in detail Software Design process and design concepts. **10**

b) Draw AON diagram and find the critical path for the given project. Find the total float time for each path and list down the critical and non-critical activities. Calculate the total duration of the project? **10**

Activity	Predecessor activity	Duration(days)
A1	None	5
A2	A1	7
A3	A1	9
A4	A2	6
A5	A3	5
A6	A4, A5	11
A7	A6	8
A8	A6	9
A9	A7, A8	7
A10	A9	6

Q.6 Write Short notes on any 4. **20**

i. Software Configuration management.
ii. V model for software development.
iii. CMM model
iv. Software Unit testing
v. Work break down structure(WBS)

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