

TE/ sem VI/ e-scheme R19/ AIML

QP-10066039

16/12/24

Time: 3 Hours

Max. Marks: 80

Instructions:

- 1) Question no 1 is Compulsory
- 2) Only Three question need to be solved.
- 4) Illustrate your answers with neat sketches wherever necessary.
- 5) Figures to the right indicate full marks.
- 6) Assume suitable additional data, if necessary and clearly state it.

- Q.1 (a) What is distributed computing? Explain any four issues of distributed computing. 05
- (b) What is group communication? Explain 1:M and M: 1 group communication. 05
- (c) Justify how Ricart-Agrawala's algorithm optimized the Message overhead in achieving mutual exclusion. 05
- (d) Explain code migration and its techniques. 05
- Q.2 (a) What are the features of DFS and explain and draw and explain Model file service architecture. 10
- (b) What is RPC? Explain the working of RPC in detail with the help of diagram. 10
- Q.3 (a) What is mutual exclusion? Explain Suzuki-Kasami Broadcast Algorithm of mutual exclusion. 10
- (b) What are the goals of a distributed system? Explain various system models of distributed computing? 10
- Q.4 (a) What is the difference between Data centric consistency models and client centric consistency models? Explain one model of each. 10
- (b) Explain Maekawa's algorithm in detail and also specify properties of Quorum Set. 10
- Q.5 (a) Discuss the need of the coordinator. Also explain any one algorithm for coordinator selection. 10
- (b) Compare Load sharing to Task Assignment and Load balancing strategies for scheduling processes in a distributed system. 10
- Q.6 (a) Explain Andrew File System (AFS) in detail. 10
- (b) What is fault tolerance? Explain various types of failure models. 10



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Q.1 Solve any Four

- A. What is Machine Learning? Explain in brief various steps in developing a machine learning application? [05]
- B. Differentiate between supervised and unsupervised learning. [05]
- C. Draw and explain Biological neuron [05]
- D. Explain in detail the MP neuron model. [05]
- E. List various applications of machine learning. And describe the SPAM/ Non-SPAM email filtering application in detail [05]

Q.2 Solve the following

- A. Draw a block diagram of the Error Back Propagation Algorithm and explain with the flow chart the Error Back Propagation Concept. [10]
- B. Find a linear regression equation for the following two sets of data: [10]

Time X in (Second)	Mass Y (Grams)
5	40
7	130
12	180
16	210
20	240

Q.3 Solve the following

- A. Diagonalize the matrix A [05]

$$A = \begin{bmatrix} 1 & 3 \\ 4 & 2 \end{bmatrix}$$

- B. Write short note on Hebbian Learning rule [05]
- C. What is the curse of dimensionality? Explain PCA dimensionality reduction technique in detail. [10]



4. Solve the following

A. Write a short note on (a) Multivariate regression and (b) Regularized Regression. [10]

B. What are activation functions? Explain Binary, Bipolar, Continuous, and Ramp activation functions. [10]

Q. 5 Solve the following

A. Find SVD of matrix A which is shown below [10]

$$A = \begin{bmatrix} 1 & 1 \\ 7 & 7 \end{bmatrix}$$

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. Ridge and Lasso Regression [05]

C. Artificial Neural Networks. [05]

D. Feature selection methods for dimensionality reduction [05]

E. Perceptron Neural Network [05]

TE | sem VI | C-scheme R19 | AIML

QP-10064710

10/12/24

Time: 3 hour

Max. Marks: 80

Note: Question 1 is compulsory. Attempt any 3 out of remaining 5 questions.

Q1

(20)

- A. Define software engineering and explain different umbrella activities
- B. Explain formal technical review.
- C. What is cost estimation? Assume that a system for simple students registration in a course is planned to be developed and its estimated size is approximately 10,000 lines of code. The organization is proposed to pay Rs 25000/month to software engineers. Compute the development effort, development time ?.
- D Differentiate White box and black box testing

Q2

- A. Discuss different categories of risk and You are the project manager for a major software company. You have been asked to lead a team that's developing "next generation" word processing software. Create a risk table for the project.. (10)
- B. Explain project scheduling and describe CPM and PERT. (10)

Q3.

- A. Develop SRS for hospital management system (10)
- B. Discuss Software configuration management. (10)

Q4

- A. Discuss project management techniques. (10)
- B. Explain software quality management with QA and QC (10)

Q5

- A. Elaborate COCOMO Method of cost estimation. (10)
- B. Explain software maintenance and different types of maintenance (10)

Q6 Write short note on any 2.

(20)

- A. Reverse engineering process
- B. Unit testing and integration testing.
- C. Software design patterns



TE | sem VI | C-scheme R-19 | AIML

QP - 10066528
5/12/2024

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 steganography with example.
 - b Write properties of hash functions.
 - c What is Digital Signature? Why digital signatures are required?
 - d List and explain various vulnerabilities in operating system.
 - e Explain penetration testing.
- 2 a Explain DES algorithm. What do you mean by double DES and triple DES [10]
- b Explain RSA with example. [10]
- 3 a Write a note on user authentication and session management. [10]
- b Explain AES algorithm in detail. [10]
- 4 a Explain Needham Schroeder Authentication protocol. [10]
- b Explain Hill cipher with suitable example. [10]
- 5 a What are database security requirements? What do you understand by Inference attacks? Explain about multilevel database security. [10]
- b Differentiate between MD5 and SHA256. [10]
- 6 a Write a note on Digital Certificate: X.509 and Public Key Infrastructure. [10]
- b Explain web security in detail. [10]
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TE | sem VI | C-scheme | AIML

QP-10064347

3/12

Time: 3 Hours

(Total Marks: 80)

- Note:-1. Question No. one is compulsory.
2. Answer any three out of the remaining questions.
3. Assume suitable data if required.

Q1 Attempt the following: (Any 4) [20]

- [A] What are the common tools used for data preparation phase and model planning phase of data analytics life cycle. [05]
[B] Differentiate Linear Regression and Logistic Regression. [05]
[C] Explain different data types in R with examples. [05]
[D] Explain in brief steps of text analysis. [05]
[E] What is time series analysis? Explain its components. [05]
[F] What is Pandas? Explain features of Pandas. [05]

Q2 Attempt the following: [20]

- [A] List and explain different phases in data analytics lifecycle. [10]
[B] Explain Autoregressive (AR), Moving Average (MA), Autoregressive Moving Average (ARMA) and Autoregressive Integrated Moving Average (ARIMA) Models in detail. [10]

Q3 Attempt the following: [20]

- [A] Calculating the regression equation of x on y and y on x from the following data and estimate x when y = 20. Also determine the value of correlation coefficient. [10]

x	10	12	13	17	18
y	5	6	7	9	13

- [B] Explain seven practice areas of text analytics. [10]

Q4 Attempt the following: [20]

- [A] Explain with justification that which analysis model is used to predict / forecast monthly average temperature in a specific region over the next year considering historical climate data. [10]
[B] Explain following data visualization libraries in Python: Box plot, Violin plot, Pie chart, Histogram, Bar chart [10]



- Q5 Attempt the following:** [20]
- [A] What is a text summarizer? How does it work? Explain the difference between extractive summarization and abstractive summarization. [10]
- [B] How is data exploration different from presentation? Explain with suitable examples? [10]
- Q6 Write a short note on:** [20]
- [A] Box-Jenkins Methodology [05]
- [B] Key roles in data analytics life cycle [05]
- [C] Stepwise regression [05]
- [D] Generalized Linear model [05]
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