TE sem V Computer R-19 C scheme

QP code : 10067276

(3 hours)

[80 marks]

12/11/2024

Computer

NOTE:

1. Question No 1 is compulsory.
2. Attempt any three questions from remaining.
3. Assume suitable data if necessary and state the same.

20

Q1 Solve all questions below

a) Design a Mealy Machine to identify if string starts with prefix ab over {a,b}*.

b) Construct a DFA for accepting all strings over {a,b} with substring abb.

c) Explain Universal Turing Machine.

d) Compare DFA and PDA

Q2

a) Find regular expression (RE) for all strings starting with b and ending in ba over {a,b}. Design NFA with epsilon moves for this RE. Convert it to equivalent DFA. — 10

b) Find the Context Free Grammar for following — 10
   i. $L = \{a^i b^j c^k \mid i = j+k\}$ ii. $L = \{x \in \{0,1\} \mid x \text{ has equal number of zeros and ones}\}$

Q3

a) Convert following grammar to Chomky Normal Form — 10
   S → AACD, A → aAb | ε, C → aC | a, D → aDa | bDb | ε.

b) State closure properties of Regular languages and Context Free Languages. — 10

Q4

a) Design PDA for $\{a^n x^n \mid n \geq 0, x \in \{b\}^*\}$. Comment if it is deterministic or not. — 10

b) Find minimum state Finite Automata accepting (01*0 + 10*). First deign a NFA with epsilon moves. — 10

Q5

a) State pumping lemma for context-free-languages. Apply pumping lemma to $L = \{ss \mid s \in \{a,b\}^*\}$. — 10

b) Design a Turing Machine to add two unary numbers. Show simulation of the machine — 10

Q6 Write Detailed note on (Any two) — 20

a) Applications of FA, PDA and TM.

b) Types of Turning Machines.

c) Chomsky Hierarchy.

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QP code: 10065726

TE sem V Computer R-19 C scheme

V—comps—SE
13/12/2024

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

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

Q. 1 Solve any Four out of the following **(5 marks each)**   20

  a. Explain the CMM model.

  b. Explain the Requirements model.

  c. Explain the LOC.

  d. Different between Alpha and Beta testing

  e. Discuss the different level of DFD.

Q.2 a Explain Risk and its types? Explain the steps involved in setting up or generating
    RMMM plan.   10

  b. Explain the Spiral model of software development   10

Q. 3 a) Explain the general format of SRS for Hospital Management system.   10

   b) Explain the FP Estimation techniques in details.   10

Q. 4 a) Explain cohesion and Coupling. Explain different types with detailed example.   10

   b) Explain the different techniques in white box testing.   10

Q. 5 a) Explain steps in version and change control.   10

   b) Explain software Re- engineering in detail.   10

Q. 6 Solve **any Four**   20

    a. Compare FTR and Walkthrough
    b. What are the different types of maintenance?
    c. Explain the tracking and scheduling.
    d. Explain the Use Case Diagram.
    e. Different between White box and Block box Testing.

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TE sem V Computer R-19 C scheme

Duration: 3hrs   V/Computer/CN   [Max Marks: 80]
18/11/2024

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	Explain with examples the classification of IPv4 addresses.	5
	B	Create 7-bit hamming code for the message bit 1110 with even parity.	5
	C	List the advantages of fiber optics as a communication Medium.	5
	D	What are sockets and its different types?	5
	E	What is the use of DNS in networking?	5

2   **Attempt the following**
A   For the class C network 193.160.10.0 having subnet mask 255.255.255.192   **10**
     finds the number of subnet created and Number of host per subnet.
B   What is network traffic congestion? How congestion is controlled?   **10**

3   **Attempt the following**
A   Explain different framing methods? What is the advantage of variable length frame over   **10**
     fixed layer frame?
B   How collision is controlled at MAC layer using CSMA/CD?   **10**

4   **Attempt the following**
A   What is use of ARP protocol? And also discuss header structure for ARP packet.   **10**
B   Which algorithms are useful for dynamic routing?   **10**

5   **Attempt the following**
A   Explain the process of connection management at TCP layer.   **10**
B   With the help TCP segment header structure, discuss importance of sequencing.   **10**

6   **Attempt the following**
A   Compare FTP and Telnet.   **10**
B   What are the benefits of Selective repeat ARQ protocol over Go-back N ARQ   **10**
     protocol?

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TE sem Vth R-19 C scheme QRcode computer 100655528

Time: 3 hours

Total Marks: 80

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Note: 1. Question no.1 is compulsory.
   2. Attempt any three out of remaining five.
   3. Assumptions made should be clearly indicated.
   4. Figures to the right indicates full marks.
   5. Assume suitable data whenever necessary.

Q. 1   Solve any four.   (05 marks each)

A Every data structure in the data warehouse contains the time element. Why?

B Explain FP Growth Algorithm.

C Explain different types of attributes.

D Discuss different applications of Web Mining.

E Explain Holdout and Random subsampling method to evaluate the accuracy of classifier.

F Differentiate between Classification and Clustering.

Q.2   (10 marks each)

A For a supermarket chain, consider the following dimensions namely product, store, time and promotion. The schema contains a central fact table for sales with three measures unit_sales, dollars_sales and dollar_cost.

   1. Draw a star schema.
   2. Calculate the maximum number of base fact table records for warehouse with the following values given below:
     • Time period 5 years
     • Store-300 stores reporting daily sales
     • Product-40,000 products in each store (about 4000 sell in each store daily)
     • Promotion- a sold item may be in only one promotion in a store on a given day.

B Explain the different techniques to handle noisy data.

  Suppose a group of sales price records has been sorted as follows:

  3, 7, 8, 13, 22, 22, 22, 26, 26, 28, 30, 37.

  Partition them into three bins by equal-frequency (Equi-depth) partitioning method. Perform data smoothing by bin mean and bin boundary.

Q.3 (10 marks each)

A Explain Updates to dimensional table in detail.

B Explain the following data pre-processing methods.

I) Dimensionality reduction II) Data transformation and Discretization

Q.4 (10 marks each)

A Given the training data for height classification, classify the tuple,

t=<Rohit, M, 1.95> using Naïve Bayes Classification.

Name	Gender	Height	Output
Kiran	F	1.6m	Short
Jatin	M	2m	Tall
Madhuri	F	1.09m	Medium
Manisha	F	1.88m	Medium
Shilpa	F	1.7m	Short
Bobby	M	1.85m	Medium
Kavita	F	1.6m	Short
Dinesh	M	1.7m	Short
Rahul	M	2.2m	Tall
Shree	M	2.1m	Tall
divya	F	1.8m	Medium
Tushar	M	1.95m	Medium
Kim	F	1.9m	Medium
Aarti	F	1.8m	Medium
Rajashree	F	1.75m	Medium

B Consider four objects with two attribute (X and Y). These four objects are to be grouped together into two clusters using k-means clustering algorithm. Following are the objects with their attribute values.

Object	X	Y
A	1	1
B	2	1
C	4	3
D	5	4

Q. 5   **(10 marks each)**

A   Given the following data, apply the Apriori algorithm. Find frequent item set and strong association rules. Given Support threshold=50%, Confidence=60%

Transaction	Items
T1	I1, I2, I3
T2	I2, I3, I4
T3	I4, I5
T4	I1, I2, I4
T5	I1, I2, I3, I5
T6	I1, I2, I3, I4

B   What is Web Mining? Differentiate between Web Mining and Data Mining. Explain types of Web Mining.

(5 marks each)

Q. 6   **Write short note on.**

A   Decision Tree Induction Algorithm

B   K-medoids clustering Algorithm

C   Multilevel and multidimensional association rule mining

D   Page Rank Algorithm

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