Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER– III• EXAMINATION – WINTER - 2016

Subject Code:3630002 Date:30/12/2016

Subject Name: Basic Computer Science- I (Applications of Data Structures and Applications of SQL)

Time:10.30 AM TO 01.00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Do as directed: **07**

1. Define Data structure.
2. Compare Stack and Queue.
3. State advantages of decision table over flowchart.
4. Name two sorting methods having average execution time $O(N^2)$.
5. State applications of stack.
6. State best and worst case time analysis for linear search algorithm.
7. Convert following infix expression into prefix expression.
   (A-B)/(C*D)+E

(b)

1. Write a note on importance of time analysis. Discuss time requirement for the algorithm to compute sum of N numbers. **03**
2. Write an algorithm to convert un- parenthesized infix expression to postfix expression. **04**

Q.2 **(a)** Define recursion. What care should be taken in writing recursive functions? Give a recursive solution for the problem of Towers of Hanoi. **07**

(b)

1. Write a short note on circular queue. **03**
2. Write an algorithm for PUSH and POP operations on Stack. **04**

OR

(b) Define Queue. Write an algorithm to perform Insertion and Deletion operation on Queue. State applications of Queue. **07**

Q.3 **(a)** State advantages of linked lists over arrays. Write an algorithm to insert a node into an ordered linked list. **07**

(b) What is sorting? State any four sorting techniques. Write an algorithm to perform Selection sort. Trace the algorithm for following input values (to arrange them in ascending order). **07**

42 23 74 11 65 58 94 36 99 87

OR

Q.3 **(a)** Write a detailed note on applications of linked list. Explain any one application with example. **07**

(b) Write an algorithm for Binary Search. Discuss time analysis for Binary Search algorithm and trace it for following sample table to search the value 275. **07**

75 151 203 275 318 489 524 591 647 727

Q.4 **(a)** Write a note on Database Life Cycle. **07**

(b)

1. Write a note on rules for SQL **03**
2. Describe features of SQL **04**

OR

Q.4 **(a)** Explain Logical Design, Conceptual Design and Physical Design. **07**

(b) 1. Explain the ALTER commands with its purpose, syntax and example. **03**
2. What are the ways of filtering table data? **04**

Q.5 **(a)** Define View. Explain readable and updatable view with suitable example. **07**

(b) 1. Explain following functions. **03**
COUNT(*) , ABS() , LTRIM()
2. Write a note on Synonym **04**

OR

Q.5 **(a)** Write a note on different types of Join. **07**

(b) 1. Elaborate the concept of Sub query. **03**
2. Write a SQL Statement for the following Customer Schema **04**
(Cust_Id, Cust_Name, Contact_No, City)
i.) Display Customers name in descending order
ii.) Add Date of birth field to Customer's schema
iii.) List all Customer's Name starts with 'H'
iv.) Delete all rows with Name starting with 'A'

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