Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/B.Tech(CHE-OLD)/SEM-3/CS-312/2011-12

2011
DATA STRUCTURE AND DATABASE CONCEPTS

Time Allotted : 3 Hours   *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

$$10 \times 1 = 10$$

  i)   Which layer lies between the presentation layer and the transport layer ?

   a) Data link   b) Physical

   c) Network   d) Session.

  ii) The OSI model consists of layers

   a) Seven   b) Five

   c) Nine d)   Three.

iii) Queue is called

    a)   LFIOb)   LIFO

    c)   FIFOd)   FILO.

iv) main ( )

    {

    int i = 4;

    int $*j$, $**k$;

    j = & i;

    k = & j;

    print f ("%d", $*k$); }

    What will be the output of this C function ?

    a)   value of i b)   value of k

    c)   value of j d)   address of k.

v) We use null value in C program written as

    a)   null   b)   0

    c)   NULL   d)   none of these.

vi) Linked lists are preferred to other data structures when

    a)   no. of elements in the list is known beforehand

    b)   the elements are in ascending and descending orders

    c)   no deletion of elements need to be performed

    d)   insertion & deletion are frequently in a list of unknown size.

vii) DBA refers to

    a)   database algorithm

    b)   database area

    c)   database administrator

    d)   none of these.

viii) DML refers to

    a)   Data multiplication language

    b)   Data manipulation language

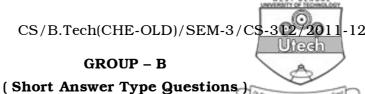   c)   Data making language

    d)   None of these.

ix) The following sequence of operation is performed on a stack :

push (1), push (2), pop, push (2), pop,pop,pop push(2), pop.

The sequence of popped out values is

a) 2, 2, 1, 1, 2   b) 2, 2, 1, 2, 2

c) 2, 1, 2, 2, 1   d) 2, 1, 2, 2, 2.

x) The best case complexity of insertion sort is

a) $O(n^2)$ b) $O(n \log n)$

c) $O(n^3)$ d) $O(n)$.

xi) The result of evaluating post-fix expression $^{*}+ab-cd$ is

a) $ab+cd-^{*}$ b) $abcd+-^{*}$

c) $ab+cd^{*}-$ d) $ab+-cd^{*}$.

xii) If a binary tree is threaded for in-order traversal a right NULL link of any node is replaced by the address of its

a) Successor   b) Predecessor

c) Root d)   Own.

GROUP – B
(Short Answer Type Questions)
Answer any *three* of the following.   3 × 5 = 15

2.   What are the differences between Stack and Queue ?

3.   What is Graph ? Distinguish between direct graph and indirect graph.

4.   What is primary key ? What is foreign key ?   2 + 3

5.   What is the difference between DDL and DML ?

6.   What is abstract data type ? Elaborate with an example.

                                                    1 + 4

GROUP – C
(Long Answer Type Questions)
Answer any *three* of the following.   3 × 15 = 45

7.   a)   What is the OSI reference model ? Discuss all the layers which are used in the OSI model with a diagram.   2 + 10

     b)   Distinguish between LAN and WAN.   3

8.   a)   Write BFS and DFS algorithm.   4 + 4

b) Here are ten integers :

28, 42, 1, 6, 4, 92, 74, 100, 115, 20
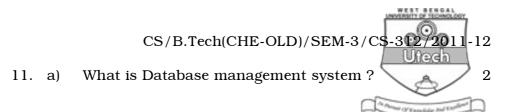
Sort them using Selection Sort showing all the stages. 7

9. a) What do you mean by tree ? 2

b) Write down the algorithm for inserting an element into a tree. 5

c) Explain AVL tree. 3

d) What are binary search tree & binary threaded tree ? 5

10. a) What are the responsibilities of network layer ? 3

b) What is a peer-to-peer process ? Explain. 3

c) What are some factors that determine whether a communication system is a LAN, MAN or WAN ? 6

d) Distinguish between internet and intranet. 3

11. a) What is Database management system ? 2

   b) What are the levels used in the DBMS architecture ?
      Explain all the levels using diagram. 7

   c) Draw E-R diagram for a Banking Sector. 6

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