



Name :

Roll No. :

Invigilator's Signature :

CS/B.TECH(CHE)(O)/SEM-3/CS-312/2012-13

2012

DATA STRUCTURE & 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 × 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) LFIO b) LIFO
 - c) FIFO d) FILO.

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[Turn over

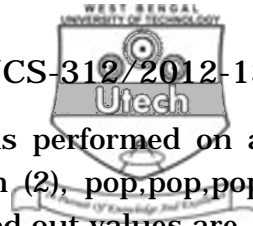


iv) `main ()`

```
{  
  int i = 4;  
  int *j, **k;  
  j = & i;  
  k = & j;  
  printf ( "%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 needs 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 sequences of popped out values are
- 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. $3 \times 5 = 15$

2. What are the differences between Stack and Queue ? 5
3. What is Graph ? Distinguish between direct graph and indirect graph. 5
4. What is primary key ? What is foreign key ? 2 + 3
5. What is the difference between DDL and DML ? 5
6. What is abstract data type ? Elaborate with an example. 1 + 4



GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

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 algorithms. $4 + 4$
- 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

