Accenture Technical Section Questions & Answers

1) Let A be a square matrix of size n x n. Consider the following program. What is the expected output?

```
C = 100
for i = 1 to n do
for j = 1 to n do
{
Temp = A[i][j] + C
A[i][j] = A[j][i]
A[j][i] = Temp - C
}
for i = 1 to n do
for j = 1 to n do
Output(A[i][j]);
```

a. Transpose of matrix A
b. Adding 100 to the upper diagonal elements and subtracting 100 from diagonal elements of A
c. The matrix A itself
d. None of these

2) Consider a hash table with 9 slots. The hash function is h(k) = k mod 9. The collisions are resolved by chaining. The following 9 keys are inserted in the order: 5, 28, 19, 15, 20, 33, 12, 17, 10. The maximum, minimum, and average chain lengths in the hash table, respectively, are

1. 3, 0 and 2
2. 4, 0, 1
3. 3, 0, and 1
4. 3, 3, and 3

3) Suppose implementation supports an instruction REVERSE, which reverses the order of elements on the stack, in addition to the PUSH and POP

instructions. Which one of the following statements is TRUE with respect to this modified stack?

1. A queue cannot be implemented using this stack.
2. A queue can be implemented where ENQUEUE takes a sequence of three instructions and DEQUEUE takes a single instruction.
3. A queue can be implemented where both ENQUEUE and DEQUEUE take a single instruction each.
4. A queue can be implemented where ENQUEUE takes a single instruction and DEQUEUE takes a sequence of two instructions.

4) A priority queue is implemented as a Max-Heap. Initially, it has 5 elements. The level-order traversal of the heap is: 10, 8, 5, 3, 2. Two new elements 1 and 7 are inserted into the heap in that order. The level-order traversal of the heap after the insertion of the elements is:

1. 10, 8, 7, 2, 3, 1, 5
2. 10, 8, 7, 1, 2, 3, 5
3. 10, 8, 7, 3, 2, 1, 5
4. 10, 8, 7, 5, 3, 2, 1

5) State True or False.

i) Binary search is used for searching in a sorted array.

ii) The time complexity of binary search is O(logn).

1. False, True
2. True, True
3. False, False
4. True, False

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6) A binary tree that has n leaf nodes. The number of nodes of degree 2 in this tree is ?

1. n
2. n - 1
3. log2n
4. n^2

7) Which of the following is true about the characteristics of abstract data types? https://www.freshersnow.com/previous-year-question-papers/

i) It exports a type.

ii) It exports a set of operations

1. False, False
2. True, True
3. True, False
4. False, True

8) A machine took 200 sec to sort 200 names, using bubble sort. In 800 sec, it can approximately sort ?

1. 800 names
2. 400 names
3. 750 names
4. 800 names

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9) The average search time of hashing with linear probing will be less if the load factor ?

1. equals one
2. is far less than one
3. is far greater than one
4. none of these

10) The initial configuration of the queue is a,b,c,d (a is the front end). To get the configuration d,c,b,a one needs a minimum of ?

1. 3 deletions and 4 additions
2. 3 deletions and 3 additions
3. 3 additions and 2 deletions
4. 2 deletions and 3 additions

11) State true or false.
i) The degree of root node is always zero.
ii) Nodes that are not root and not leaf are called as internal nodes.

1. False, False
2. True, True
3. False, True
4. True, False

12) The number of binary trees with 3 nodes which when traversed in post order gives the sequence A,B,C is ?

1. 9
2. 3

3. 7

4. 5

13) Which of the following is not the internal sort?

1. Insertion Sort
2. Merge Sort
3. Heap Sort
4. Bubble Sort

14) Consider the tree arcs of a BFS traversal from a source node W in an unweighted, connected, undirected graph. The tree T formed by the tree arcs is a data structure for computing.

1. the shortest path from W to every vertex in the graph.
2. the shortest paths from W to only those nodes that are leaves of T.
3. the longest path in the graph
4. the shortest path between every pair of vertices.

15) The number of swapping needed to sort numbers 8,22,7,9,31,19,5,13 in ascending order using bubble sort is ?

1. 12
2. 11
3. 14
4. 13

16) The postfix expression for * + a b - c d is?

1. ab cd + - *
2. ab + cd * -
3. ab + - cd *

4. ab + cd - *

17) Given two sorted lists of size m and n respectively.The number of comparisons needed in the worst case by the merge sort algorithm will be?

1. min(m,n)
2. mn
3. max(m,n)
4. m+n-1

18) State True of False.

i) Network is a graph that has weights or costs associated with it.

ii) An undirected graph which contains no cycles is called a forest.

iii) A graph is said to be complete if there is no edge between every pair of vertices.

1. True, True, True
2. True, False, True
3. True, True, False
4. False, True, True

19) Consider the following pseudo code. What is the total number of multiplications to be performed?

```
D = 2
for i = 1 to n do
for j = i to n do
```

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for k = j + 1 to n do
D = D * 3

1. Half of the product of the 3 consecutive integers.
2. One-third of the product of the 3 consecutive integers.
3. One-sixth of the product of the 3 consecutive integers.
4. No

20) If the sequence of operations - push(1), push(2), pop, push(1), push(2), pop, pop, pop, push(2), pop are performed on a stack, the sequence of popped out values are ?

1. 2, 1, 2, 2, 1
2. 2, 1, 2, 2, 2
3. 2, 2, 1, 2, 2
4. 2, 2, 1, 1, 2