Siliguri Institute of Technology
QUIZ
Subject: Data Structure and Algorithm(PCC-CS301)
Department of IT

Answer the following MCQ questions using tick (☑) mark

Total Marks: 20

1. A program P reads in 500 integers in the range [0..100] experimenting the scores of 500 students. It then prints the frequency of each score above 50. What would be the best way for P to store the frequencies?

A. An array of 50 numbers
B. An array of 100 numbers
C. An array of 500 numbers
D. A dynamically allocated array of 550 numbers

2. Which of these best describes an array?

A. A data structure that shows a hierarchical behavior
B. Container of objects of similar types
C. Container of objects of mixed types
D. All of the mentioned

3. What is the time complexity of following code?

```
int a = 0;
for (i = 0; i < N; i++)
{
for (j = N; j > i; j--)
{
a = a + i + j;
}
}
```

A. O(N)   B. O(N*log(N))
C. O(N * Sqrt(N))   D. O(N*N)

4. The Worst case occur in linear search algorithm when

A. Item is somewhere in the middle of the array
B. Item is not in the array at all
C. Item is the last element in the array
D. Item is the last element in the array or is not there at all

5. The worst case occur in quick sort when

A. Pivot is the median of the array
B. Pivot is the smallest element
C. Pivot is the middle element
D. None of the mentioned

6. What is the worst case run-time complexity of binary search algorithm?

A. $O(n^2)$ B.O(nlog n)
C. $O(n^3)$ D. O(n)

7. If there's no base criteria in a recursive program, the program will
    A. not be executed
    B. execute until all conditions match
    C. execute infinitely
    D. obtain progressive approach

8. The depth of complete binary tree is given by
    A. $D_n = n \log_2 n$
    B. $D_n = n \log_2 n + 1$
    C. $D_n = \log_2 n$
    D. $D_n = \log_2 n + 1$

9. The postfix form of the expression $(A+ B)*(C*D- E)*F / G$ is?
    A. AB+ CD*E – FG /**
    B. AB + CD* E – F **G /
    C. AB + CD* E – *F *G /
    D. AB + CDE * – * F *G /

10. Which data structure is needed to convert infix notation to postfix notation?
    A. Branch   B. Tree   C. Queue   D. Stack

11. For an undirected graph with n vertices and e edges, the sum of degree of each vertex is equal to
    A. 2n   B. 2e   C.(e2+1)/2   D.(2n-1)/2

12. Consider the following definition in c programming language

```
Struct node
{
  int data;
  struct node * next;
}
typedef struct node NODE;
NODE *ptr;
```

Which of the following c code is used to create new node?
    A. ptr = (NODE*)malloc(sizeof(NODE));
    B. ptr = (NODE*)malloc(NODE);
    C. ptr = (NODE*)malloc(sizeof(NODE*));
    D. ptr = (NODE)malloc(sizeof(NODE));

13. What does the following function do for a given Linked List with first node as *head*?
```
void fun1(struct node* head)
{
 if(head == NULL)
  return;
  fun1(head->next);
 printf("%d ", head->data);
```

}
(A) Prints all nodes of linked lists
(B) Prints all nodes of linked list in reverse order
(C) Prints alternate nodes of Linked List
(D) Prints alternate nodes in reverse order

14.Which of the following sorting algorithms can be used to sort a random linked list with minimum time complexity?
 (A) Insertion Sort   (B) Quick Sort
 (C) Heap Sort   (D) Merge Sort

15. A circularly linked list is used to represent a Queue. A single variable p is used to access the Queue. To which node should p point such that both the operations enQueue and deQueue can be performed in constant time?
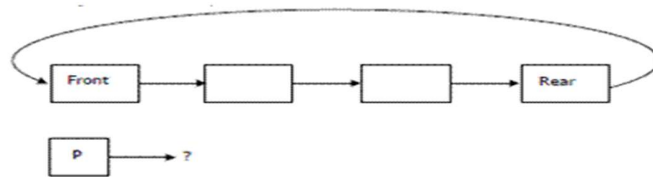
 (A) rear node   (B) front node
 (C) not possible with a single pointer   (D) node next to front

16. You are given pointers to first and last nodes of a singly linked list, which of the following operations are dependent on the length of the linked list?
(A) Delete the first element
(B) Insert a new element as a first element
(C) Delete the last element of the list
(D) Add a new element at the end of the list

17. Which of the following operations is performed more efficiently by doubly linked list than by linear linked list?
(A) Deleting a node whose location is given
(B) Searching an unsorted list for a given item
(C) Inserting a node after the node with a given location
(D) Traversing the list to process each node

18.The time required to search an element in a linked list of length n is
 (A) O (log n)   (B) O (n)
 (C) O (1)   (D) O(n²)

19. Which of the following methods can be used to find the largest and smallest number in a linked list?
 (A) Recursion
 (B) Iteration
 (C) Both Recursion and iteration
 (D) Impossible to find the largest and smallest numbers

20. The ratio of items present in a hash table to the total size is called
(A)Balance Factor (B) Load Factor (C) Item Factor   (D) Weight Factor
21. The prefix expression for the infix expression: a*(b+c)/e-f is
(A)/*a+bc-ef   (B)-/*+abcef   (C)-/*a+bcef   (D) None of these