1. What is a data structure?
   a. A programming language
   b. A collection of algorithms
   c. A way to store and organize data
   d. A type of computer hardware
2. What are the disadvantages of arrays?
   a. Index value of an array can be negative
   b. Elements are sequentially accessed
   c. Elements are sequentially accessed
   d. There are chances of wastage of memory space if elements inserted in an array are lesser than the allocated size
3. The data structure required to check whether an expression contains a balanced parenthesis is?
   a. Queue
   b. Stack
   c. Tree
   d. Array
4. Which of the following is not the application of stack?
   a. Data Transfer between two asynchronous processes
   b. Compiler Syntax Analyzer
   c. Tracking of local variables at run time
   d. A parentheses-balancing program
5. Which data structure is needed to convert infix notation to postfix notation?
   a. Tree
   b. Branch
   c. Stack
   d. Queue
6. What is the value of the postfix expression 6 3 2 4 + – *?
   a. 74
   b. -18
   c. 22
   d. 40
7. Which of the following statement(s) about stack data structure is/are NOT correct?
   a. Top of the Stack always contains the new node
   b. Stack is the FIFO data structure
   c. Null link is present in the last node at the bottom of the stack
   d. Linked List is used for implementing Stacks
8. The prefix form of A-B/ (C * D ^ E) is?
   a. -A/B*C^DE
   b. -A/BC*^DE
   c. -ABCD*^DE
   d. -/*^ACBDE
9. Which of the following points is/are not true about Linked List data structure when it is compared with an array?
   a. Random access is not allowed in a typical implementation of Linked Lists
   b. Access of elements in linked list takes less time than compared to arrays
   c. c) Arrays have better cache locality that can make them better in terms of performance
   d. d) It is easy to insert and delete elements in Linked List
10. Which of the following tree data structures is not a balanced binary tree?
    a. Splay tree
    b. B-tree
    c. AVL tree
    d. Red-black tree
11. Which of the following is not the type of queue?
    a. Priority queue
    b. Circular queue
    c. Single-ended queue
    d. Ordinary queue

12. What is the functionality of the following piece of code?

```
main()
{
   char str[]="san foundry";
   int len = strlen(str);
   int i;
```

```
   for(i=0;i<len;i++)
        push(str[i]);  // pushes an element into stack

   for(i=0;i<len;i++)
      pop();  //pops an element from the stack
}
```

a. yrdnuof nas
b. foundry nas
c. sanfoundry
d. san foundry

13. What is the functionality of the following piece of code?

```
public void display()
{
       if(size == 0)
              System.out.println("underflow");
       else
       {
              Node current = first;
              while(current != null)
              {
                     System.out.println(current.getEle());
                     current = current.getNext();
              }
       }
}
```

a. display the list
b. reverse the list
c. reverse the list excluding top-of-the-stack-element
d. display the list excluding top-of-the-stack-element

14. Five node splitting operations occur when an entry is inserted into a B-tree. Then how many nodes are written?
a. 14
b. 7
c. 11
d. 5

15. In linked list implementation of a queue, where does a new element be inserted?
a. At the head of link list
b. At the centre position in the link list
c. At the tail of the link list
d. At any position in the linked list

16. In linked list implementation of a queue, from where is the item deleted?
a. At the head of link list
b. At the centre position in the link list
c. At the tail of the link list
d. Node before the tail

17. The essential condition which is checked before deletion in a linked queue is?
a. Underflow
b. Overflow
c. Front value
d. Rear value

18. Which of the following is true about linked list implementation of queue?
a. In push operation, if new nodes are inserted at the beginning of linked list, then in pop operation, nodes must be removed from end
b. In push operation, if new nodes are inserted at the beginning, then in pop operation, nodes must be removed from the beginning
c. In push operation, if new nodes are inserted at the end, then in pop operation, nodes must be removed from end
d. In push operation, if new nodes are inserted at the end, then in pop operation, nodes must be removed from the beginning

19. While evaluating a prefix expression, the string is read from?

a. left to right
b. right to left
c. center to right
d. center to left to right

20. Find the output of the following prefix expression.

$$* + 2 - 2\ 1 / - 4\ 2 + - 5\ 3\ 1$$

a. 2
b. 12
c. 10
d. 4