CHRIST (DEEMED TO BE UNIVERSITY), BENGALURU - 560029

End Semester Examination March/April - 2019
Bachelor of Computer Applications II SEMESTER

Code: BCA234 Max.Marks: 100
Course: DATA STRUCTURES Duration: 3Hrs

SECTION A

Answer ALL Questions

10X2 = 20

- **1** Define data type and abstract data type.
- 2 What is the disadvantage of a linear search algorithm?
- **3** What are the operations possible on strings?
- **4** What are the different types of queue?
- **5** What is a linked list? Mention its advantages.
- **6** What is meant by dummy header?
- 7 What are the different types of tree traversal techniques available? Give one example for each type.
- **8** Define degree of a node.
- **9** What is the complexity of bubble sort?
- **10** Determine the graph of the given set representations
 - **1.** $V(G1)=(0, 1, 2, 3); E(G1)=\{(0,1), (0, 2), (0, 3), (1,2), (1, 3), (2, 3)\}$
 - **2.** V(G2)=(0, 1, 2); E(G2)={<0,1>, <1, 0>, <1, 2>}

SECTION B

Answer Any FIVE Questions

5X6 = 30

- 11 Determine the time complexity of the iterative function for finding the sum of n numbers using step count.
- 12 Create two dimensional array of size 10 by 10. Write a function disappear() that deletes 20 elements randomly.
- 13 What would be returned by the following recursive function after we call test(2, 5)?

```
int test (int a, int b)
{
if (a==b) return (1);
else if (a>b) return(0);
else return (a+test(a+1, b));
}
```

- **14** Briefly explain the applications of stack with suitable examples.
- 15 How do you find the length of a circular linked list?
- **16** Write an algorithm for PREORDER traversal in a Binary Tree.
- 17 Breadth First Search for a graph is similar to Breadth First Traversal of a tree. Justify with the relevant algorithms.

SECTION C

Answer Any FIVE Questions

5X10 = 50

- 18 Design the rules for saving a sparse matrix with minimum memory space. Write a neat algorithm to store the sparse matrix using the rules framed.
- 19 Write a program that accepts a string as input and find the frequency of occurrence of a given character in it.
- **20** Discuss the process of the evaluating an expression using data structures.
- 21 Write down routines for inserting and deleting elements into a circular queue using arrays.
- **22** Discuss the operations of queue using a linked list.
- 23 Write a function for a post-order traversal of a binary tree. Explain the function

- with an arithmetic expression.
- 24 Consider the following attributes of a ticket in railway reservation system: Ticketnumber, Passenger-Name, Source, Destination and waiting-list-number. Write a C program to sort the passengers based on Waiting-list-number using Insertion sort.