**18U332** (Pages: 2) Name: …….

Reg. No……...……

**THIRD SEMESTER B.C.A. DEGREE EXAMINATION, NOVEMBER 2019**

(Regular/Supplementary/Improvement)

(CUCBCSS-UG)

**CC17U BCA3 B04 - DATA STRUCTURES USING C**

(Computer Applications - Core Course)

(2017 Admission onwards)

Time: Three Hours Maximum: 80 Marks

## PART A

Answer ***all*** questions. Each question carries 1 mark.

1. What is a matrix that is mainly populated with zeroes?
2. What is the condition of the stack due to pushing an element into full stack?
3. Name the linear list of elements in which deletion can be done from one end and insertion can take place only at the other end.
4. What is the type of expression in which operator succeeds its operands?
5. Name the data structure used for implementing recursion.
6. What is the other name of Reverse Polish notation?
7. Name the operation of processing each element in the list.
8. Which type of sorting is Merge sort?
9. How many leaf nodes are there in a complete binary tree of depth ‘d’?
10. In binary trees, name the nodes with no successor.

**(10 x 1 = 10 Mark)**

## PART B

Answer ***all*** questions. Each question carries 2 marks.

11. List some of the static data structures in C.
12. Define linear data structures.
13. Evaluate the expression $4572 + - *$
14. Define a priority queue.
15. Differentiate between array and linked list.
16. List any two applications of queues.
17. Define a complete binary tree.
18. What is the advantage of hashing in data structure?

**(8 x 2 = 16 Mark)**

## PART C

Answer any ***six*** questions. Each question carries 4 marks.

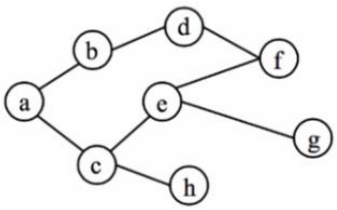
19. Explain insertion sort with the help of an example.
20. What is recursion? Explain with an example.
21. Convert the Infix expression a – b / c * d + e * f / g into Postfix expression.
22. List any four applications of queue.
23. Explain how you will delete a node from the end of a singly linked list.
24. State the properties of a binary tree.
25. What do you mean by indegree, outdegree, path and cycle in a graph?
26. Write the algorithm for pre order and post order tree traversal.
27. Write short note on hash functions.

**(6 x 4 = 24 Marks)**

## PART D

Answer any ***three*** questions. Each question carries 10 marks.

28. What is a stack? Explain push and pop operations in stack using suitable example. Mention any four applications of stack.
29. Write the algorithm for converting infix expression to postfix expression. Also, translate the infix expression $A * (B + D)/E - F * (G + H/K)$ into its equivalent post fix expression
30. Why it is said that searching a node in a binary search tree is efficient than that of a simple binary tree? Create a Binary Search Tree for the following data and do inorder, preorder and postorder traversal of the tree $50, 60, 25, 40, 30, 70, 35, 10, 55, 65$
31. What are the data structures used for Depth First and Breadth First Search in graphs? Using suitable data structures perform Depth First and Breadth First Search in the following graph:




32. What do you mean by collision in hashing? What are the collision resolution methods?

**(3 x 10 = 30 Marks)**

*******