

21U319S

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Name:

Reg. No:

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2022

(CUCBCSS-UG)

CC17U BCS3 B04 - DATA STRUCTURES USING C

(Computer Science - Core Course)

(2017, 2018 Admissions – Supplementary/Improvement)

Time: Three Hours

Maximum: 80 Marks

SECTION A

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

1. Name the data structures used to implement recursion.
2. A linked list with two links each pointing to the predecessor and successor of a node is known as -----
3. Name the matrix with value of maximum elements as zero.
4. What is the condition when a pop() operation is called on an empty queue?
5. Define hashing.
6. What is the complexity of bubble sort algorithm?
7. Which data structure is used to represent hierarchical relationship between elements?
8. What would be the prefix notation for the equation $A+(B*C)$?
9. What is the time complexity of binary search?
10. Which data structure is used in breadth first search of a graph to hold nodes?

(10 × 1 = 10 Marks)

SECTION B

Answer *all* questions. Each question carries 3 marks.

11. Distinguish time complexity and space complexity?
12. What do you mean by recursion?
13. Differentiate linear and non-linear data structures. Give example.
14. What are the advantages of linked list over array?
15. Define the term graph?

(5 × 3 = 15 Marks)

SECTION C

Answer any *five* questions. Each question carries 5 marks.

16. Define Data Structure. What are different classifications of data structures? Explain with examples.
17. Convert the Infix expression $a - b / c * d + e * f / g$ into postfix expression with proper steps.

18. What is single linked list? Explain how you will delete a node from the end of a singly linked list?
19. Explain the way to represent a sparse matrix using arrays?
20. Define queue. How insertion and deletion operations are performed over a queue? Explain.
21. What are binary trees? Explain various binary tree traversal techniques?
22. What is a binary search tree? Construct a binary search tree with 54,23,78,45,43,12,89,56,90?
23. Explain selection sorting technique with suitable example.

(5 × 5 = 25 Marks)

SECTION D

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

24. What is a circular queue? Write the algorithms for insertion and deletion operations on a circular queue.
25. Discuss the application of graph structures. Explain BFS and DFS.
26. Explain the various stack operations. Implement them using array.
27. Explain quick sorting technique with suitable algorithm and example.
28. Differentiate linear search and binary search technique? Explain with examples?

(3 × 10 = 30 Marks)
