



K21U 2074

Reg. No. :

Name :

III Semester B.Sc. Degree (CBCSS – Sup./Imp.)

Examination, November 2021

(2015-'18 Admissions)

CORE COURSE IN COMPUTER SCIENCE

3B04CSC : Data Structure

Time : 3 Hours

Max. Marks : 40

SECTION – A

1. One word answer. (8×0.5=4)

- a) Tower of Hanoi is an application of _____ data structure.
- b) _____ is a linear list in which elements can be added or removed at either end but not in middle.
- c) In _____ tree traversal algorithm, the root node is processed first.
- d) A binary tree T is defined as a finite set of elements called _____
- e) The situation in which there is no free space to insert new data is known as _____
- f) In a linked list, the next pointer field contain _____
- g) Arranging records in some logical order is called _____
- h) _____ search starts from the middle position of an array.

SECTION – B

Write short notes on **any seven** of the following questions. (7×2=14)

2. What is a priori analysis ?
3. Compare merge sort and quick sort.

P.T.O.



4. Define data structure.
5. Write any two applications of stack.
6. What are the tasks performed during inorder traversal ?
7. Convert the following expression into postfix and prefix form - $A + B + C / D$.
8. Write about different types of linked list.
9. What is binary search tree ?
10. What is the difference between a stack and a queue ?
11. Parenthesis are never needed in prefix or postfix expressions. Why ?

SECTION – C

Answer **any four** of the following questions.

(4×3=12)

12. State the difference between array and linked list.
13. Define node, degree, siblings, depth and level of a tree.
14. Convert the infix expression $(a + b) * (c + d) / f$ into postfix and prefix expression.
15. Write the different ways to represent a binary tree.
16. Construct a binary tree whose nodes in inorder and preorder are given as follows :
Inorder : 10, 15, 17, 18, 20, 25, 30, 35, 38, 40, 50
Preorder : 20, 15, 10, 18, 17, 30, 25, 40, 35, 38, 50
17. Define circular queue. Write the procedure to create a circular queue.



SECTION - D

Write an essay on **any two** of the following questions.

(2×5=10)

18. Write the algorithm to create a doubly linked list.
 19. Describe the algorithm to convert an infix expression to a postfix expression, with the following infix expression as input $A + B - C / D * E * F * G / H$.
 20. Devise a representation for a list where insertions and deletions can be made at either end. Such a structure is called Deque (Double ended queue). Write algorithm for inserting and deleting elements at either end.
 21. Write about different types of data structure and its applications.
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