



**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 apriori 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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