



K17U 2004

Reg. No. : .....

Name : .....

**III Semester B.C.A. Degree (CBCSS – Reg./Sup./Imp.)  
Examination, November 2017  
(2014 Admn. Onwards)  
General Course  
3A12BCA : DATA STRUCTURE**

Time : 3 Hours

Max. Marks : 40

**SECTION – A**

1. **One word answer.**

- a) \_\_\_\_\_ is an example for a non-linear data structure.
- b) In column major order representation of a two dimensional array A, the address of the  $(i, j)^{\text{th}}$  element is calculated as \_\_\_\_\_
- c) The operation of accessing each record exactly once, so that certain items in the record may be processed is termed as \_\_\_\_\_
- d) The prefix form of the expression  $(A \times B - C)$  is \_\_\_\_\_
- e) A linked list with two links each pointing to the predecessor and successor of a node is known as \_\_\_\_\_
- f) To insert an element into a circular queue with size  $n$ , the location of the element is calculated using the expression \_\_\_\_\_
- g) A binary tree which is dominated solely by the left child nodes or right child nodes is called \_\_\_\_\_
- h) In \_\_\_\_\_ tree traversal, we visit the root node last. (8x $\frac{1}{2}$ =4)

**SECTION – B**

Write short notes on **any seven** of the following questions :

- 2. Differentiate between static and dynamic data structures.
- 3. What is the difference between time complexity and space complexity ?
- 4. While comparing the performance of quick sort and bubble sort algorithms, which one is best ? Why ?

P.T.O.



5. Differentiate between Push and Pop operations of stack.
6. What is a circular queue ?
7. Why linear linked list becomes efficient compared to one dimensional array ?
8. Convert  $(A - B) * (C/D) + E$  into postfix form.
9. What do you mean by a skewed binary tree ?
10. What is compaction ?
11. How will you represent a binary tree in computer's memory using a one dimensional array ? (7×2=14)

#### SECTION – C

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

12. Write an algorithm to perform bubble sort.
13. Describe how limitations of a queue are handled in a circular queue.
14. Write recursive procedure to solve tower of Hanoi problem.
15. Write a C++ program to delete a node from a singly linked list.
16. Describe various binary tree traversals.
17. Briefly explain about various memory representations of a two dimensional array. (4×3=12)

#### SECTION – D

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

18. Write a program to evaluate a post-fix expression using stack. Explain with an example.
19. Write an algorithm to sort a list of numbers using merge sort. Explain the process of sorting with an example.
20. Write a C++ program to insert a node in a sorted linked list.
21. Write short notes on :
  - a) Sparse matrix representation using linked list
  - b) Binary search trees. (2×5=10)