II Semester B.C.A. Degree Examination, July/August 2024
(NEP) (Freshers and Repeaters)
COMPUTER APPLICATIONS
Data Structures Using C

Time : 2½ Hours

Max. Marks : 60

Instruction : *Answer **all** the Sections.*

SECTION – A

I. Answer **any 6** questions. **Each** question carries **2** marks :   **(6×2=12)**

1) Mention the applications of Data structure.

2) Differentiate between malloc() and calloc().

3) What are the different operations that can be performed on arrays ?

4) What is sparse matrices ?

5) What is a linked list ?

6) What is garbage collection ?

7) Define stack.

8) What is a Queue ? What are the different types of Queues ?

9) Define binary search tree. Give an example.

SECTION – B

II. Answer **any 4** questions. **Each** question carries **6** marks :   **(4×6=24)**

10) Write a C program to find the GCD of given two integers using recursive function.

11) Explain binary search algorithm with an example.

12) Write short notes on singly linked list and doubly linked list.

13) Write an algorithm to traverse a singly linked list.

14) Mention the applications of stacks and queues.

15) Explain binary tree traversal with an example.

P.T.O.

SECTION – C

III. Answer **any 3** questions. **Each** question carries **8** marks :   **(3×8=24)**

16) a) Write a program to implement tower of Hanoi using recursion.   **(5+3)**

    b) What is Asymptotic notation ? Mention the types.

17) Explain inserting and deleting elements in an array.

18) Write an algorithm for inserting and deleting a node in a singly linked list.

19) a) Write a 'C' program to implement queue operation using array.   **(5+3)**

    b) Convert the infix expression (A+B)*(C+D) into postfix expression.

20) Define the following terms with example.   **(2+2+2+2)**

    a) Root node.

    b) Siblings.

    c) Terminal node.

    d) Internal node.