Second Semester B.C.A Degree Examinations

May / June 2026

(CBCS NEP Scheme)

PAPER: NBB 0210: DATA STRUCTURES USING C

Time: 2 hrs] *[Max. Marks: 60*

Instructions to Students:

1. ***The Students should legibly write Section number along with question numbers within the margin ONLY.***
2. ***The answer without Section number and question numbers will not be valued.***
3. ***Draw neat and labelled diagram wherever necessary.***
4. ***Section – I multiple Choice Questions should be answered in the first page of main answer book and same questions shall not be answered repeatedly.***
5. ***Any identifications like marking, ticking, dots etc., in the options of MCQ (Section – I) on the question paper is strictly prohibited. Do not write anything (except register number) on the question paper.***

SECTION – I

I. Select the most appropriate answer from the options provided: 10 ×1 = 10

I - 1) _____ is an example for primitive data structure.

a) Array b) Record
c) Integer d) Pointer

I - 2) nCr = _____

a) $n!/(n-r)!$ b) $n!/\left((n-r)!n!\right)$ c) $n!/(n-r)!r!$ d) none

I - 3) ADT stands for _____

a) Abstract Data Tuple b) Abstraction Data Type
c) Absolute Data Tuple d) Abstract Data Type

I - 4) Array is a group of _____ elements.

a) Homogeneous b) Heterogeneous c) Dissimilar d) None

I - 5) The postfix equivalent of $a + b * c$ is _____

a) $abc +*$ b) $ab + c *$ c) $abc * +$ d) $ab + * c$

Contd..... 2

I - 6) The operation used to add an element into a stack is _____

a) *peep* b) *pop* c) *push* d) *change*

I - 7) The dynamic memory function used for garbage collection is _____

e) *malloc()* f) *free()* g) *realloc()* h) *calloc()*

I - 8) In a linked list, an element can be inserted at the _____ of the list

a) Beginning b) End c) Middle d) Any position

I - 9) The root node in a binary tree can have _____ number of children.

a) 0 b) 1
c) 2 d) all

I - 10) The order of nodes visited in preorder traversal is _____

a) root – left-right b) left-right – root
c) left – root – right d) root – right - left

SECTION – II

II. Answer any FIVE of the following: 5 × 3 = 15

III - 1) Write a recursive algorithm to find the GCD of two numbers m and n.

III - 2) Write a note on applications of data structures.

III - 3) Explain the insertion and deletion operations in a linear array.

III - 4) Write the algorithm of binary search method.

III - 5) Explain the overflow condition in a circular queue with suitable example.

III - 6) Evaluate the given postfix expression 344 * 2 - +

III - 7) What is a linked list ? Explain any one operation on linked list.

III - 8) Construct the binary search tree for the following data

14 25 7 3 - 1 28 79

Contd..... 3

SECTION – III

III. Answer any THREE of the following: 3 × 5 = 15

III - 1) Compare the recursive and iterative algorithms with suitable example.

III - 2) Write an algorithm for merge sort.

III - 3) What is a stack ? Explain the push and pop operation of stack with their algorithm.

III - 4) Explain malloc, realloc, calloc and free functions with example.

III - 5) Write algorithm for any two types of binary tree traversals.

SECTION – IV

IV. Answer the following: 2 × 10 = 20

IV - 1) a) Briefly explain non-primitive data structures.
b) Write an algorithm for quick sort. (3 + 7)

OR

a) Write a note on applications of stack.

b) What is a queue ? Write algorithm for insert and delete operations on a simple queue. (5 + 5)

IV - 2) a) Write a note on circular linked list and doubly linked list.
b) Write an algorithm to traverse the elements of singly linked list. (5 + 5)

OR

a) Define the following
i) root ii) leaf iii) depth iv) complete binary tree

b) Construct a binary tree given the following traversals of the tree
Postorder : *e d b g f c a*
Inorder : *e d b a f g c* (4 + 6)

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