

Vidya Vikas Mandal's  
Shree Damodar College of Commerce & Economics, Margao-Goa  
FYBCA, Semester-II, Semester End Examination, April-May 2023  
Data Structures (CAC-105) -Truncated Syllabus 2021-2022

Duration : 2 Hours

Marks : 60

*Instructions: 1) Figures to the right indicate Full Marks.  
2) All Questions are compulsory.*

**Q.1.A) Define the following:**

**5X1=05**

- a. Postfix Expression
- b. Space Complexity
- c. Data Structure
- d. Primitive Data Structure
- e. Expression tree

**Q.1.B) Match the Following and Rewrite the Matched Pairs :**

**5X1=05**

1) Binary Search	A) First In Last Out
2) Multidimensional Array	B) Divide and conquer
3) Linear Data Structure	C) has at least one child node
4) Internal node	D) Sequential access
5) Four Books Kept in a Box (Size of is same as the Book Size)	E) Matrix

**Q.2. Answer the following:**

- a) Specify the minimum and maximum index of an Array of Size 9. **02**
- b) Explain any two operations performed on a queue data structure. **03**
- c) Illustrate the steps of performing Binary Search to search a number 80 in the following array. **05**

10	15	25	70	75	80	89
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**Q.3. Answer the following:**

- a) Show the Step-by-Step process of sorting the below given 4 numbers in ascending order, using any sorting method : 02

2,30,11,78

- b) Perform and show the steps for the following operations on a stack of size 6. 03

(a) Push 23,56,7,14,10,4

(b) Pop 2 times

(c) Push 80,60,20

- c) Perform the following operations on a queue data structure of size 5: 05

i. Enqueue 7,10,12,15,20,25

ii. Check if Queue is Full

iii. Dequeue 2 times

**Q.4. Answer the following:**

- a) Show the structure of a node in Doubly Linked List. 02

- b) Mention two advantages of Linked List over Arrays. 03

- c) Perform the following operations on a Linear Linked List and show the changes step by step: 05

(a) Create the first node with Value 45 and Address as 8899

(b) Insert two nodes at the end with value 25 and address as 5676 and value 7 and address as 8988.

(c) Delete the first node in the Linked List.

(d) Insert a node at the beginning with value as 66 and address as 8899.

**Q.5. Answer the following:**

- a) Differentiate between almost complete binary tree and complete binary tree. 02
- b) Mention two advantages of a doubly linked list. 03
- c) Explain the memory representation of singly linked list with the help of a diagram. 05

**Q.6. Answer the following:**

- a) Write the algorithm for performing Linear Search. 02
  - b) Construct a Binary search tree for the following data elements and find the balance of each node. 10, 7, 16, 20, 25, 4, 30 03
  - c) Illustrate heap sort by constructing the min heap for the given input elements : 18, 25, 45, 75, 8, 20. 05
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