

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)

**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. Hashing

- 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) Can hold a single value
4) Primitive Data Structure	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 **05**  
number 80 in the following array.

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 02 numbers in ascending order, using any sorting method :

2,30,11,78

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

(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 05 5:

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 05 the changes step by step:

(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.

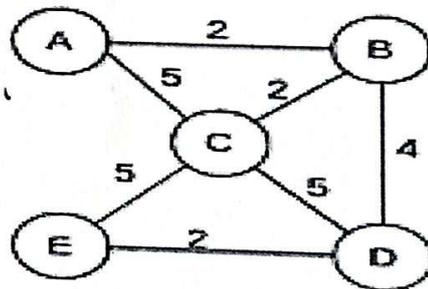
(d) Insert a node at the beginning with value as 66 and address as 8899.

Q.5. Answer the following:

- a) What is Breadth First Search Traversal in a Graph? 02
- b) Construct a Graph with the following information given in an Adjacency Matrix as follows : 03

0	2	4
2	0	3
4	3	0

- c) Construct an Adjacency Matrix / Adjacency List for the following Graph: 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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