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Shree Damodar College of Commerce & Economics, Margao-Goa
FY BCA Semester-II, Semester End Examination June 2022
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) Fill in the blanks   **(5X 1 = 05)**

a) When an element is removed from the queue the _____ index of the queue changes.

b) Students filling admission form at a college office counter in a line , is an example of _____ Data Structure.

c) _____ complexity to the refers to the total amount of memory space used by an algorithm/program

d) A _____ is a tree in which all the nodes are completely filled except the last level.

e) _____ tree is a self-balancing binary search tree.

Q.1. (B) Match the Following and Rewrite the Matched Pairs   **(5X 1 = 05)**

1. Circular Queue	A. float
2. Quicksort	B. Stack
3. Datatype	C. Divide and Conquer Sort
4.Bubble Sort	D. Exchange Sort
5.Data Structure	E. FIFO

Q.2 Answer the following:

(a) Show the Syntax of declaring a One dimensional Array of integers having 5 numbers. (02)

(b) Differentiate between Linear and Non-Linear Data Structure. (03)

(c) Show the various steps of applying the bubble sort method on

the following numbers: (05)

20	11	35	17	14

Q.3 Answer the following:

(a) Differentiate between Linear and Binary Search. (02)

(b) Devise an example to show the Infix to Prefix Conversion method. (03)

(c) Show steps of Searching 23 in the following array using binary search. (05)

23	15	65	42	28	7	90	34	50

Q.4 Answer the following:
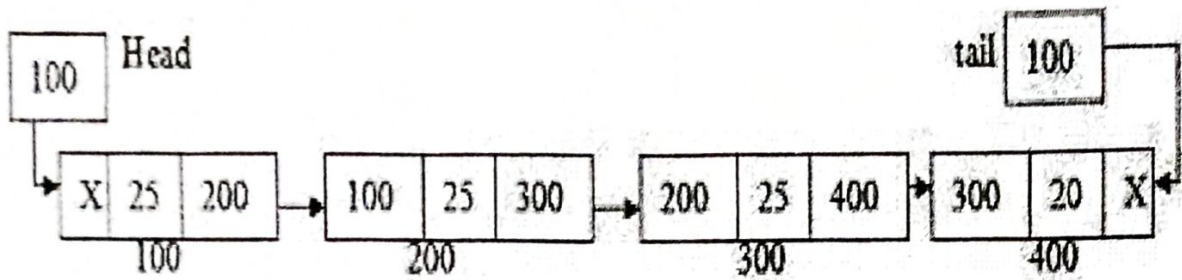
(a) Convert the following expression from Infix to Prefix : 8*2+5 (02)

(b) Illustrate the steps of performing the Popping of an element from a stack of 8 numbers . (03)

(c) Evaluate the following Postfix Expression, using a stack and show every step.

   4 5 + 4 2 + * (05)

Q.5 Answer the following:

(a) Define the structure for Doubly Linked list. (02)

(b) Differentiate between Arrays and Linked list. (03)

(c) Choose and do <u>any one</u> of the following on the below given doubly linked list

   i) Show the memory representation for the following doubly linked list.

<div align="center">OR</div>

   ii) Perform the operations of adding one node at the end and deleting
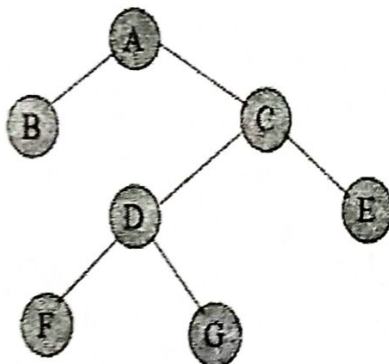   the last node from the given doubly linked list.

Doubly Linked List with 4 Nodes

Q.6. Answer the following:
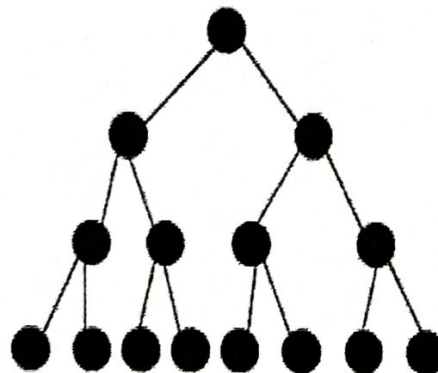
(a) Identify the type of tree   (02)

(i)   (ii)

(b) Draw expression tree for the following expression   (03)

$(b * c) + (e * f)$

(c) Create a Binary Search Tree for the following numbers and perform preorder traversal.   (05)

25, 53, 11, 24, 37, 8, 20, 57, 35, 40