AJAY KUMAR GARG ENGINEERING COLLEGE, GHAZIABAD
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
Sessional Test

Program: B.Tech
Session: 2025-26

Semester: III
Section: IT1, 2, 3, CSIT1, 2, CSE 1, 2, 3, CSE (AIML1,2), AIML, CSE-DS-1,2,CS1,2

Subject: Data Structure Using C
Max. Marks: 50

Subject Code: BCS-301
Time: 2 Hours

OBE Remarks:

Q.No	1	2	3	4	5	6	7	8	9	10	11	12
CO No.	CO1	CO1	CO2	CO2	CO3	CO1	CO1	CO2	CO2	CO3	CO1	CO2
Bloom's Level* (L1 to L6)	L1	L2	L3	L3	L4	L2	L6	L2	L2	L6	L3	L3

Weightage CO1: 21.5   **Weightage CO2: 21.5**   **Weightage CO3: 7**

Bloom's Level: L1: Remember, L2: Understand, L3: Apply, L4: Analyze, L5: Evaluate, L6: Create

Note: Answer all the sections with all the questions

Section-A
(2*5=10)

1. Discuss the time & space complexity of algorithms.
2. What role does AVAIL list play in a linked list? Explain
3. Circular queue has advantage over linear queue. Give reason for the same.
4. Evaluate the postfix expression 3 2 ^ 5 * 3 2 * 3 / 5 + -
5. Differentiate between sequential search and binary search.

Section-B
(5*5=25)

6. What do you understand by best, worst and average case analysis of an algorithm? Give prop notations for these complexity measures.
7. Write the algorithmsfor insertion and deletion in a doubly linked list.
8. Write down a C program to insert, delete and display elements in Queue.
9. Convert the following expression into prefix and postfix using stack.

    (A+B)*(C$(D-E)+F)-G

10. Show the result of the following operations on the DEQUEUE given below-

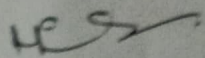|			P	Q	R	

   I)   Insert Right A
   II)   Insert Right B
   III)   Insert Right C
   IV)   Remove Left
   V)   Remove Right
   VI)   Insert Left X
   VII)   Insert Left Y
   VIII) Insert Left Z
   IX)   Remove Right

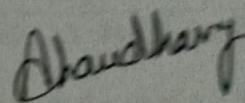<u>Section-C</u>   (7.5*2=15)

11. Assume that the declaration of multidimensional array X and Y to be X [-15.......20,15.....40] and
    Y[-7.....11, -3.....19, 5......26].
    a. Find the length of each dimension and number of elements in X and Y.
    b. Find the address of element Y[2, 5, 20]. Assume the base address of Y=1000 and each element
        occupies 2 memory allocations.

12. (i) Write an algorithm for solving Tower of Hanoi problemand draw recursion tree for n=4 disks
    showing each step.
    (ii) Write Short note on: a) Tail Recursion or Simulating Recursion

                        b) Abstract Data Type

Faculty Sign   **HoD Sign**