**UTTARANCHAL UNIVERSITY, DEHRADUN**
**UTTARANCHAL SCHOOL OF COMPUTING SCIENCES**
**MID TERM EXAMINATION**
**ODD SEMESTER 2023-24**
BCA | 2nd Semester
**DATA STRUCTURE USING 'C' | BCA – C-201**

Time: **1:15 Hour** Max. Marks: **30**

*Note: All questions are compulsory.*

**Q.1- Answer the following questions.(1 x 6 = 6 Marks)**

**Multiple Choice Questions**

**a)** What is the value of the postfix expression 6 3 2 4 + – *? (CO-1, BL-3)

a.74 b. -18
c.22 d. 40

**b)** Which of the following points is/are not true about Linked List data structure when it is compared with an array? (CO-1, BL-1)

a. Random access is not allowed in a typical implementation of Linked Lists
b. Arrays have better cache locality that can make them better in terms of performance
c. Access of elements in linked list takes less time than compared to arrays
d. It is easy to insert and delete elements in Linked List

**c)** What will be the output of the following C code? (CO-2, BL-6)

```
#include <stdio.h>
int main()
{
 int arr[5]={10,20,30,40,50};
 printf("%d", arr[5]);
   return 0;
}
```

a. Garbage b. 10
c. 50 d. None of these

**State True/ False**

**d)** An objective way to compare two algorithms is by comparing their execution time irrespective of the machines. (CO-1, BL-2)

**e)** Stack overflow is a condition resulting from trying to push an element on a full stack. (CO-3, BL-1)

f) Most appropriate data structure to print a list of elements in reverse order is Queue data structure (CO-1, BL-2)

**Q.2-Write short note on any two (up to 70 words) (2 x 3 = 6 Marks)**

a) Define linked list. What are the common operations that can be performed on a linked list. (CO-2, BL-3)

b) Write the steps to insert and delete a node in Doubly Link List with C code. (CO-2, BL-4)

c) What will you prefer between singly and doubly linked lists for traversing through list of elements? (CO-2, BL-2)

**Q.3-Attempt any one of the following (1 x 6 = 6 Marks)**

a) Write a C code to add the two polynomials. Give the linked representation of following polynomial.

$12x^3 - 23x^2 + 9x - 11$ (CO-2, BL-6)

**OR**

b) Write a C program to solve Tower of Hanoi puzzle recursively and also explain the recursive function. (CO-2, BL-6)

**Q.4- Attempt any one of the following. (1 x 6 = 6 Marks)**

a) Write a program to read two integer arrays. Merge the two arrays and display the result of an array in reverse order. (CO- 3, BL-6)

**OR**

b) Convert the following into its equivalent post fix expression using stack. (CO- 3, BL-6)

i) A+(B+C*(D+E)) +F/G

ii) (A-B)/((D+E)*F)

**Q.5- Attempt any one of the following. (1 x 6 = 6 Marks)**

a) What is a queue and how it is differs from a stack? Write a C function to insert a new element in a queue. (CO- 2, BL-6)

**OR**

b) Explain how an underflow and overflow condition checked in circular queue. (CO- 2, BL-6)

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