

IM.Sc (CS) (NEP) Sem.2, Examination
Advanced Programming
June-2025

Date : 23/6/2025, Monday
 Time : 2.30 Hours]

[Max. Marks : 50

- Q.1 A. Explain Narayan Pandit's Sum of Sum of Sums. 5+5
 B. Explain how the king solved the problem of placing grains of wheat in geometric progression on the squares of chess board. Explain geometric progression

OR

- Q.1 A. Explain Meru Prastaar. 5+5
 B. Explain Aryabhata's Sum of Sums.

- Q.2 A. Explain time complexity of algorithms. 5+5
 B. With suitable examples, explain operations (read and write) on array of structure using pointers.

OR

- Q.2 A. Differentiate between structure and union, with suitable example. 5+5
 B. Differentiate between static and dynamic memory allocation.

- Q.3 A. Convert "p * q * r - s + t - a ^ b" to postfix expression 5+5
 B. Evaluate postfix expression : "2 4 + 5 * 3 / 8 4 * 2 / -"

OR

- Q.3 A. With example explain array implementation of circular queue. Explain condition when the circular queue is considered to be full and when empty. 5+5
 B. Explain how you would represent a 2-variable polynomial using linked list. Show appropriate structure to represent each node of polynomial.

- Q.4 A. Explain insertion sort with example. 5+5
 B. Differentiate between linear search and binary search with suitable example. List their respective advantages and disadvantages.

OR

- Q.4 A. Explain the statements for declaring, opening and closing a text file in 'C' language. 5+5
 B. Explain following with respect to files in 'C' language : putw, rewind, fseek

Q.5 Answer any 10 out of 12

10

```
#include<stdio.h>
main()
{
    char a[]="hello";
    char *p1=a, **p3=&p1;

}
```

Answer q.1 and q.2 with respect to above code.

- 1 printf("%c \n",(*p1)++);
- 2 printf("%c \n",**p3);
- 3 _____ Operator is used to determine size of a linked list.
- 4 Give output of following code snippet:


```
int a1=5, *b=&a1;
printf("%d %d\n",b,*b);
```
- 5 In the statement $n = \text{ftell}(fp)$, what should be the data type of 'n' ?
- 6 State meaning of "putc(c,fp)"
- 7 Two structure variables can be compared using '=' operator. (True/False).
- 8 Queue is LIFO structure. (True/False).
- 9 Reverse polish notation is another name of prefix expression. (True/False).
- 10 _____ is used in non-recursive implementation of recursive algorithm. (stack/queue)
- 11 In a priority queue two elements with the same priority are processed on a FCFS basis. (True/False).
- 12 Shell sort uses insertion sort for internal sorting. (True/False)