

KATHMANDU UNIVERSITY  
End Semester Examination  
June/July, 2023

Marks Scored:

Level : B.Tech.

Year : I

Exam Roll No. :

Time: 30 mins.

Registration No.:

Course : AIPC 101

Semester : I

F. M. : 10

Date :

SECTION "A"

[20Q. × 0.5 = 10 marks]

**Encircle the most appropriate alternative from each set of choices.**

- Which of the following language is the predecessor to C Programming Language?  
a. COBOL                      b. ALGOL                      c. BCPL                      d. FORTRAN
- Which of the following is invalid?  
a. ' '                      b. ""                      c. 'x'                      d. 'xyz'
- x++ executes faster than x+1 because .....  
a. ++ is faster than +                      b. x++ is a single instruction  
c. x uses register                      d. x uses pointer
- What will be the output of the following arithmetic expression?  
 $5 + 3 * 2 \% 10 - 8 * 6$   
a. -37                      b. -42                      c. -32                      d. -28
- Which of the following doesn't require an & for the input in scanf()?  
a. char name[10];                      b. int name[10];  
c. float name[10];                      d. all of the above
- Which of the following is an invalid if-else statement?  
a. if(a){}                      b. if(if(a == 1)){ }                      c. if((char) a){ }                      d. if(func1 (a)){ }
- When ..... is encountered inside any loop, control automatically passes to the first statement after loop.  
a. break                      b. continue                      c. goto                      d. return
- Recursion is similar to which of the following?  
a. if-else                      b. switch-case                      c. nested if-else                      d. loop
- What is the scope of extern class specifier?  
a. Within a block                      b. Global Multiple files  
c. Within a program                      d. None of the above
- Choose correct statements about C Language Pass by Value.  
a. Pass By Value copies the variable value in one more memory location  
b. Pass By Value does not use Pointers  
c. Pass By Value protects your source or original variables from changes in outside functions or called functions  
d. All the above

11. What is the output of the following program?

```
#include<stdio.h>
int abc(int i)
{
    return (i++);
}
main(){
    int i = abc(10);
    printf("%d ",--i);
}
```

- a. 10                      b. 9                      c. 8                      d. 12

12. What will be the address of the arr[2][3] if arr is a 2-D long array of 4 rows and 5 columns and starting address of the array is 2000?

- a. 2042                      b. 2048                      c. 2052                      d. 2056

13. Let x be an array. Which of the following operations are invalid?

- I. ++x                      II. x+1                      III. x++                      IV. x\*2  
a. I and II                      b. I, II and III                      c. I, III and IV                      d. II, III and IV

14. Choose a correct statement about C String.

- ```
char str[]="Hello..!";
```
- a. Character array, str is a string  
b. Size of str is not mentioned  
c. String cannot contain special characters  
d. String has no Null character at the end

15. What will be the output of the following C code?

```
#include<stdio.h>
main() {
    int a[] = {1,2,3,4,5}, *p;
    p = a;
    ++*p;
    printf("%d ", *p);
    p += 2;
    printf("%d ", *p);
}
```

- a. 2 1                      b. 2 2                      c. 2 3                      d. 2 4

16. Choose the statement which is incorrect with respect to dynamic memory allocation.

- a. Memory is allocated in a less structured area of memory, known as heap.  
b. Execution of the program is faster than that of static memory allocation.  
c. Used for unpredictable memory requirements.  
d. Allocated memory can be changed during the run time of the program based on the requirement of the program.

17. Which of the following is not an application of structure?

- a. Structure is used to implement Linked Lists, Stack and Queue data structures.  
b. Structures are used in Operating System functionality like Display and Input taking.  
c. Structure are used for storing information in random memory locations.  
d. Structure are used to exchange information with peripherals of PC.

18. What is the output of this C code?

```
#include<stdio.h>
structure Student
{
    int price;
    char item[20];
}s;
main()
{
    strcpy(s.item, "KTM");
    s.price = 150;
    printf("%s", s.item);
}
```

- a. Compiler Error    b. Empty String    c. KTM    d. 150

19. Which files will get closed through the fclose() in the following program?

```
void main()
{
    FILE *fp, *ft;
    fp = fopen("Test1.txt", "r");
    ft = fopen("Test2.txt", "r");
    fclose(fp, ft);
}
```

- a. Test1    b. Test2  
c. Both Test1 and Test2    d. Error in fclose

20. fseek() should be preferred over rewind() mainly because .....

- a. rewind() doesn't work for empty files  
b. rewind() may fail for large files  
c. rewind() may not evaluate stream more than once  
d. rewind doesn't provide a way to check if the operations completed successfully

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SECTION "B"  
[6Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. How are imperative programming different from declarative programming? Write an algorithm and draw flowchart to read N numbers from user and display the largest one among the entered numbers.
2. List the different types of operators according to their function? Justify the statement "remainder operator works only for integer type operands".
3. What are formatted and unformatted I/O functions? Describe different format specifiers of scanf().
4. Which among the switch statements and ladder if-else statements is more convenient to use? Write a C program to read two numbers say  $n_1$  and  $n_2$  where  $n_1 < n_2$  then display the numbers between  $n_1$  and  $n_2$  that are multiples of 5.
5. What is a recursive function? What are its requirements? Explain with example.
6. Differentiate between local variables and global variables. When do we use static variables? Explain with example.
7. What is the difference between r+ and w+ mode in file opening? Write a C program to open a file named RECORD.txt for storing information like Name, Roll and Score of 10 students.

SECTION "C"  
[2Q. × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. If an array is passed to a function and several of its elements are changed within the function, are those changes recognized in the calling portion of the program? Explain. Write a C program to remove the white space from a string.
9. Justify the statement "Pointer is the jewel of the C language". Implement calloc() to store 10 values inputted by user and display them in sorted order.
10. Is there any difference between array and structure? Explain with examples. Write a C program that has a structure named EMPLOYEE with attributes E\_Name, E\_Post and E\_Salary. Read the values of these attributes for 5 employees and display the employee info with highest salary value.



13. The bedrock horizon at depth of 48+ feet is called as \_\_\_\_\_.
14. The most important of the materials moved and redeposited by water is called \_\_\_\_\_.
15. All the material picked up, mixed, disintegrated, transported, and deposited through the action of glacial ice or of water is called as \_\_\_\_\_.
16. The unsorted or slightly sorted material at the base of slopes, accumulated largely as rock fragments that have fallen down slope under influence of gravity is called \_\_\_\_\_.
17. Soil acidity determined by pH measurement during a routine soil test is known as \_\_\_\_\_ acidity.
18. Gas exchange is by partial pressure, is called \_\_\_\_\_.
19. The process in which heat is transmitted from the hotter to the colder part of the body in contact with each other by internal molecular motion is \_\_\_\_\_.
20. The upper horizons with the most weathered portion of the profile is known as \_\_\_\_\_.

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SECTION "B"

(Short answer questions)  
[6Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. Write about cation and anion exchange capacity.
2. What is soil colloids? Explain its types.
3. Describe phosphorous cycle in ecosystems.
4. What are different types of soil acidity?
5. Explain Graham' law of diffusion.
6. Describe on any four types of soil.
7. What are different components of soil profile? Describe.

SECTION "C"

(Long answer questions)  
[2Q. × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. What are different steps on evolution of the soil? How different factors affect soil formation?
9. Explain different types of nutrient cycling that occurs in ecosystem. Why these cycles are important for soil?
10. Describe about soil classification of Nepal. What are specific soil problems and threats to Nepalese soil?