KATHMANDU UNIVERSITY
End Semester Examination [C]
May/June, 2019

04 JUN 2019

Level : B.E./B.Sc./B.Tech.
Year : I
Time : 2 hrs. 30 mins.

Course : COMP 103
Semester: I
F. M. : 40

SECTION "B"
[6 Q. × 4 = 24 marks]

Attempt *ANY SIX* questions.

1. How can an array be declared in C-programming? Briefly explain datatype, identifier and variable with proper variable statement. [1+3]

2. Write a C program to count total number of prime numbers stored in an array using function. Explain the program in comment section.

3. What is associativity of an operator? Discuss in brief about a type of operator which has right to left associativity. [1.5+2.5]

4. Using if...else ladder, write a program to compute and output the number of digits in any user input number. Consider the following cases:
   If number is between 0 and 9: 1 digit number
   If number is between 10 and 99: 2 digit number
   If number is between 100 and 999: 3 digit number
   If number is above 999: above 3 digit number
   For any other number: Invalid input

5. Write a program to read a binary number and convert it into decimal one.
   Example: $111=1*2^2+1*2^1+1*2^0=1*4+1*2+1=7$

6. Write in brief about the advantages of modularization in C-programming.

7. Write short notes on: [2+2=4]
   a. Unformatted I/O functions b. Pointer to structure

SECTION "C"
[2 Q. × 8 = 16 marks]

Attempt *ANY TWO* questions.

8. Differentiate between dynamic memory allocation and automatic memory allocation in an array. Briefly explain DMA functions with proper syntax in C programming. [3+5]

9. How a recursion consumes more memory and takes more execution time than its iterative counterpart? Explain it with an appropriate example. Write a recursive program to find the sum of $n$ natural numbers, where $n$ is a user input number. [4+4]

10. Define a structure "Distance" with two entities "km" and "m" (both of type int) and write a program to take five distance values as input and display them in ascending order. Write a function named *void swapDistance(Distance *a,Distance *b)* to swap two distance values. [5+3]

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Marks Scored:

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Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date : 04 JUN 2019

SECTION "A"
[20 Q. × 0.5 = 10 marks]

*Choose the most appropriate answer from the given options and* ***encircle*** *the letter of your choice.*

1. What value does testarray[2][1][0] in the sample code below contain?
int testarray[3][2][2] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}
a. 5 b. 7 c. 3 d. 11

2. Which of the following is the correct way of declaring a float pointer?
a. float ptr; b. float *ptr; c. *float ptr; d. float ptr*;

3. What is the output of following segment of program?
```
char *ptr;
char myString[] = "abcdefg";
ptr = myString;
ptr += 5;
printf("%c", *ptr);
```
a. f b. e c. g d. d

4. If an array name is passed as an argument to a function, what actually is passed?
a. Value of elements in array
b. First element of the array
c. Base address of the array
d. Address of the last element of array

5. What is the output of following segment of program?
```
main()
{int x = 10;
      { int x = 0;
      }
   printf("%d",x);}
```
a. 10 b. 0 c. 100 d. Compilation error

6. How many times the word "hello" is printed by the following segment of program?
```
void main()
{
int a = 0;
while(a++ < 5)
printf("hello");
}
```
a. 4 times b. Infinite times c. 0 time d. 5 times

7. What is the output of below program?

```
void main()
{
int i,j,count;
count=0;
for(i=0; i<5; i++);
{     for(j=0;j<5;j++);
      { count++;
      }
}
printf("%d",count);
}
```

a. 25 b. 24 c. 1 d. Infinite loop

8. Which of the following data type specifier has the longest life in program execution?
a. Static b. Local c. Register d. Automatic

9. Which of the following statement is false?
a. Dynamic Memory Allocation may allocates memory in stack and heap region of memory.
b. Dynamic Memory Allocation allocates memory during run time of program.
c. Dynamic Memory Allocation can vary memory allocation during run time.
d. Dynamic Memory Allocation is efficient way of memory usage.

10. The loop in which the statements within the loop are executed at least once is called __.
a. Entry controlled loop b. Exit controlled loop
c. Middle controlled loop d. Recursion

11. When applied to a variable, what does the unary "&" operator yield?
a. The variable's value b. The variable's binary form
c. The variable's address d. The variable's format

12. Which of the following statement is true for recursive function?
a. Recursive function has less algorithm clarity than its iterative counterpart.
b. Recursive function takes less execution time than its iterative counterpart.
c. Recursive function takes more execution time and memory than its iterative counterpart.
d. Recursive function takes less memory than its iterative counterpart.

13. What will be the value of variable a?

```
int a;
a=(4 || 0) && 4;
```

a. 0 b. 1 c. 4 d. Error

14. Considering pass by reference, which one is True?
a. The change in formal parameters is reflected in actual parameters.
b. The change in actual parameters is reflected in formal parameters.
c. The actual parameter is received as a pointer.
d. The value is copied to the formal parameters.

15. Which of the following is not a formatted I/O function?
a. fprintf b. printf c. scanf d. gets

16. What is the output of the following program code?

```
main()
{int i=abc(10);
printf("%d",--i);
}
int abc(int i)
{return(i++);}
```

a. 10 b. 11 c. -1 d. 9

17. Function can return pointer to a particular variable.
a. True b. False
c. Depend on compiler d. Depend on standards.

18. Which of the following is valid identifier?
a. ab& b. extern c. break d. Main

19. *'typedef'* keyword helps to_____.
a. define new data type.
b. define new function.
c. define a structure data type.
d. define new name to existing datatype.

20. *'break'* keyword is used to_____.
a. Come out of switch statement.
b. Jump out of any control statement.
c. Jump to next iteration of loop.
d. Jump from one control statement to other control statement.