ESS101 : Programming 1 (C Programming)
Quiz 2 : 16th September, 2019, 3 to 3.30 pm

1: What is the output when the following piece of (C) code is executed?

```
char str1[] = "Equal";
char str2[] = "Equal";
if (str1 == str2) printf("Equal");   str1==str2 compares the addresses of the two variables
else printf("Not Equal");
```

(1) Equal (2) Not Equal (3) Error (4) None of these

2: What is the output when the following piece of (C) code is executed?

```
char name[] = "John\0Doe\0";   strlen = 4
printf("%s",name);             sizeof = 10
```

(1) Garbage value (2) John (3) Doe (4) John\0Doe\0

3: Pick the correct statement(s) with respect to (C) language:
I. The body of a function may have many return statements.
II. The body of a function should have only one return statement.
III. If return statement is omitted, then the function does its job but returns no value to the calling environment.
(1) Only I (2) Only II (3) Only III (4) Both I and III

4: Multiple functions can exchange data between one another using which one of the below?
(1) Function arguments (2) External variables (3) Return values (4) All of the above

5: Consider the following piece of (C) code :

```
    char a[10][10], b[10][10], i, j;
    memset(a,0,sizeof(a));
    memset(a,1,10 * sizeof(char));
    memset(a[1],2, 10 * sizeof(char));
    for (i = 0; i < 10; i++) {
        for (j = 0; j < 10; j++) {
            b[i][j] = a[j][i];
        }
    }
```

At the end of execution of the above code :
(1) Matrix **b** is equal to matrix **a** (2) Matrix **b** will be a Null matrix
(3) Matrix **b** is transpose of matrix **a** (4) None of the above

6: Consider the following function written in (C) :

```
int value = 0;
int testme(int a)
{
```

```
    if (a > 0) return (testme(a-1) * a);
    return 1;
}
```

Which of the followng is true when `value = testme(5);` is executed?
(1) Compilation error (2) `value` has value 0 (3) `value` has value 120 (4) None of the above

7: What is the output when the following piece of (C) code is executed? Answer: __-128__

```
char a = 127;    signed char is -128 to +127
                 unsigned char is 0 to 255
a++;
printf("%d", a);it wraps around like a circle
```

8: Consider the 2 dimensional array : `char xyz[20][25];`
Assuming that the array is stored starting at address 200, what is the address of `xyz[5][10];`
Answer: _____

9: Which of the following will give a compilation error?

```
(1) int array[5];
(2) int array[];
(3) int array[5] = {1, 2, 3, 4, 5};
(4) int array[5] = {1, 2};
```

10: If the return type for a function is omitted which of the following is assumed by the compiler:
(1) `char` (2) `float` (3) `int` (4) `void`

11: Variables that come into existence when the function is entered and goes out of scope when it is left are called :
(1) Automatic Variables (2) Global Variables (3) Register Variables (4) External variables

12: Consider the declaration `char myvar[] = "SeventyEight";`.
What is the output when `printf("%d", sizeof(myvar));` is executed? _____

13: What is the output after executing the following (C) code: _____

```
void myAreaFunction(int myArea)
{
    int myArea = 3.14 * myArea * myArea;
}
main()
{
    int myArea = 10;
    myAreaFunction(myArea);
    printf("%d", myArea);
}
```

14: Consider the declaration `short myvar[15];`.
What is the output when `printf("%d", sizeof(myvar));` is executed? _____

15: Pick the correct statement(s) with respect to (C) Language:
(I) A source program can span across multiple files
(II) A function cannot span across multiple files
(III) The C preprocessor provides for conditional compilation
(1) Only I (2) Both I and II (3) Both II and III (4) All the above

16: Consider the following (C) program along with the respective program line numbers:

```
10:     int val = 99, testVal = 1;
11:     if ( ! testVal && val++) {   only one is executed and you get your result
12:         val = 299;               here only !testVal part will be executed
13:     }
```

What is the value of `val` when control comes to line 13? _____

17: Here is an example of a (C) program written by a **careless** programmer.

```
void main() {
    int i, number = -5, value = 10;
    if (number >= 0)
        for (i = 0; i < number; i++)          dangling else problem
            if (value == 10)                  last else actually belongs to the if inside the loop
            {
                    printf("Value correct");
                    return;
            }
    else
        printf("Error: n is negative");
}
```

What is the output after its execution?
(1) Value correct (2) Error: n is negative (3) Compilation Error (4) None of the above

18: The piece of (C) code : **for (;;) { }** is an example of :
(1) Compilation Error (2) A do-nothing operation (3) Infinite Loop (4) Dummy function

19: What is the output of the following (C) program? _____

```
void main()
{
    int i = 10;
    {
        int i = 20;
        {
            int i = 30;
        }
        printf("%d", i);
    }
}
```

20: What is the output when the following piece of (C) code is executed?

```c
int a[5] = {5, 1, 15, 20, 25};
int i, j, k;
i = ++a[1];
j = a[1]++;
k = a[1] * a[2];
printf("%d, %d, %d", i, j, k);
```

(1) 2, 2, 45 (2) 2, 2, 3 (3) 1, 2, 45 (4) 2, 2, 30

Programming question :
Write a program in C to calculate the sum of numbers from 1 to n using recursion. Make any suitable assumptions and mention them clearly as comments at the start of your program.

1: What is the output when the following piece of (C) code is executed?

```
char str1[5] = "Equal"; legal way of declaration though it does not have null at the last
if (str1 != "Equal") printf("Not Equal");
else printf("Equal");
```

(1) Equal (2) Not Equal (3) Error (4) None of these

2: Here is an example of a (C) program written by a **careless** programmer.

```
void main() {
    int i, number = -5, value = 10;
    if (number >= 0)
        for (i = 0; i < number; i++)
            if (value == 10)
            {
                printf("Value correct");
                return;
            }
    else
        printf("Error: n is negative");
}
```

What is the output after its execution?
(1) Value correct (2) Error: n is negative (3) Compilation Error (4) None of the above

3: What is the output of the following (C) program? _____

```
void main()
{
    int i = 10;
    {
        int i = 20;
        {
            int i = 30;
        }
    }
    printf("%d", i);
}
```

4: What is the output when the following piece of (C) code is executed?

```
char name[] = "John\0Doe\0"; strlen is 4
printf("%d",strlen(name));      sizeof is 10
```

(1) Garbage value (2) 7 (3) 9 (4) 4

5: Pick the incorrect statement(s) with respect to (C) language:
I. If return statement is omitted in a function, we get compilation error.
II. The body of a function should have only one return statement.
III. The body of a function may have multiple return statements.
(1) Both I and III (2) I only (3) II only (4) Both I and II

6: Functions communicate with each other via :?
(1) External variables (2) Return values
(3) Function arguments (4) All of the above

7: Consider the following function written in (C):

```
int quizQuestion(int arg)
{
    if (arg > 0) return (arg * quizQuestion(arg-1));
    return -1;
}
```

What is the output when `printf("%d", quizQuestion(4));` is executed?
(1) 120 (2) Compilation error (3) 24 (4) None of the above

8: Consider the following piece of (C) code :

```
char a[10][10], b[10][10], i, j;
memset(a,0,sizeof(a));
for (i = 0; i < 10; i++) {
    for (j = 0; j < 10; j++) {
        a[i][i] = i * j;
    }
}
```

At the end of execution of the above code, the matrix **a** will be of type :
(1) Null matrix (2) Diagonal matrix (3) Upper Triangular (4) Lower Triangular

9: What is the output when the following piece of (C) code is executed? Answer: _____

```
printf("%d", sizeof(char) * sizeof(unsigned char));
```

10: Consider the 2 dimensional array : `char twoDarray[45][45];`
Assuming that the array is stored starting at address 100, what is the address of `twoDarray[25][15];`
Answer: _____

11: Which of the following will give a compilation error?

(1) `int array[2][] = {{1,2}, {3,4}};`
(2) `int array[5] = {-1, -2, -3, -4, -100 };`
(3) `int array[500];`
(4) `int array[] = {1, -1};`

last n-1 index sizes of n dimensional array should be filled, rest all are optional, in other words only first index size is optional
12: If the return type for a function is omitted which of the following is assumed by the compiler:
(1) `void` (2) `int` (3) `double` (4) `char`

13: What is the output after executing the following (C) code: _____

```
void myTemparatureConverter(int temp)
{
     temparature = (temparature - 32) * (5/9);
}
main()
{
    int temparature = 32;
    myTemparatureConverter(temparature);
    printf("%d", temparature);
}
```

14: Variables that come into existence when the function is entered and goes out of scope when it is left are called :
(1) Static Variables (2) Automatic Variables (3) External Variables (4) Global variables

15: Consider the declaration `char myvar[] = "FortyOne";`.
What is the output when `printf("%d", sizeof(myvar));` is executed? _____

16: Pick the incorrect statement(s) with respect to (C) Language:
(I) A source program cannot span across multiple files
(II) A function can span across multiple files
(III) The C preprocessor provides for conditional compilation
(1) Only I (2) Only II (3) Only III (4) Both I and II

17: Consider the following (C) program along with the respective program line numbers:

```
10:    int val = 1, testVal = 0;
11:    if (testVal && val++) {
12:        val = 0;
13:    }
```

What is the value of `val` when control comes to line 13? _____

18: The piece of (C) code : **for (;1;) { }** is an example of :
(1) Recursive operation (2) A do-nothing operation (3) Compilation Error (4) Infinite Loop

19: Use of functions:
(1) helps to avoid repeating a set of statements many times
(2) enhances the logical clarity of the program
(3) can be used to perform the same set of actions more than once
(4) all of the above

20: What is the output when the following piece of (C) code is executed?

```
int a[5] = {5, 1, 15, 20, 25};
int i, j;
i = ++a[1];
j = a[1]++;
printf("%d, %d, %d", i, j, a[1]);
```

(1) 3, 2, 1 (2) 2, 2, 3 (3) 1, 2, 2 (4) 2, 2, 1

Programming question :
Write a program in C to print the array elements using recursion. Make any suitable assumptions and mention them clearly as comments at the start of your program.

1: What is the output when the following piece of (C) code is executed?

```
char str1[] = "Equal";
if (str1 == "Equal") printf("Equal");
else printf("Not Equal");
```

(1) Equal (2) Not Equal (3) Error (4) None of these

2: What is the output when the following piece of (C) code is executed?

```
char name[] = "\0John\0Doe\0";
printf("%d",strlen(name));
```

(1) Garbage value (2) 0 (3) 9 (4) 4

3: Pick the incorrect statement(s) with respect to (C) language:
I. The body of a function should have only one return statement.
II. If return statement is omitted in a function, we get compilation error.
III. A return statement MUST ALWAYS be present in a function.
(1) Both I and II (2) Both I and III (3) Both II and III (4) All of the above

4: Which one of the following is the right choice for functions to send data among one another?
(1) Return values (2) Function arguments
(3) External variables (4) All of the above

5: What is the output of the following (C) program? _____

```
void main()
{
    int i = 10;
    {
        int i = 20;
        {
            int i = 30;
        }
        printf("%d", i);
    }
}
```

6: Consider the following piece of (C) code:

```
    char a[10][10], b[10][10], i, j;
    memset(a, 0, sizeof(a));
    for (i = 0; i < 10; i++) {
        for (j = 0; j < 10; j++) {
            a[i][j] = (i < j) ? 0 : i+j;
        }
    }
```

At the end of execution of the above code:
(1) Matrix **a** is a lower triangular matrix (2) Matrix **a** is an upper triangular matrix
(3) Matrix **a** is a null matrix (4) None of the above

7: Here is an example of a (C) program written by a **careless** programmer.

```
void main() {
    int i, number = -5, value = 10;
    if (number >= 0)
        for (i = 0; i < number; i++)
            if (value == 10)
            {
                    printf("Value correct");
                    return;
            }
    else
        printf("Error: n is negative");
}
```

What is the output after its execution?
(1) Value correct (2) Error: n is negative (3) Compilation Error (4) None of the above

8: Consider the following function written in (C):

```
int functionTest(int a)
{
    if (a > 0) return (functionTest(a-1) + a);
    return 0;
}
```

What is the output when `printf("%d", functionTest(10));` is executed?
(1) 55 (2) Compilation error (3) 120 (4) None of the above

9: What is the output when the following piece of (C) code is executed? __255__

```
    unsigned char charVal = -1;
    printf("%d", charVal);
```

10: Consider the 2 dimensional array : `char TestArray[25][20];`
Assuming that the array is stored starting at address 400, what is the address of `TestArray[15][10];`
Answer: _____

11: Which of the following will give a compilation error?

```
(1) int array[5] = {1, 1, 1, 1, 1, 1 };
(2) int array[100] = {1};
(3) int array[5] = {1, 2, 3, 4, 5};
(4) int array[] = {1000, 10000};
```

12: If the return type for a function is omitted which of the following is assumed by the compiler:
(1) `int` (2) `float` (3) `void` (4) `long`

13: What is the output after executing the following (C) code: _____

```
void myTestFunction(int myValue)
{
    myValue = myValue * 100;
}
main()
{
    int myValue = 55;
    myTestFunction(myValue);
    printf("%d", myValue);
}
```

14: Variables that come into existence when the function is entered and goes out of scope when it is left are called :
(1) Register Variables (2) External Variables (3) Global Variables (4) Automatic variables

15: Consider the declaration `char myvar[] = "Twentynine";`.
What is the output when `printf("%d", sizeof(myvar));` is executed? _____

16: Pick the correct statement(s) with respect to (C) Language:
(I) The C preprocessor provides for conditional compilation
(II) A function can span across multiple files
(III) A source program can span across multiple files
(1) Only I (2) Both I and III (3) Only II (4) Only III

17: Consider the following (C) program along with the respective program line numbers:

```
10:    int val = 10, testVal = 1;
11:    if (testVal || val++) {   only testVal is executed
12:        val = 50;
13:    }
```

What is the value of `val` when control comes to line 13? _____

18: Consider the declaration `unsigned short myvar[40];`.
What is the output when `printf("%d", sizeof(myvar));` is executed? _____

19: The piece of (C) code : **for (;0;) { }** is an example of :
(1) Infinite Loop (2) Compilation Error (3) A do-nothing function (4) A no-operation segment

20: What is the output when the following piece of (C) code is executed? _____

```
int a[5] = {5, 1, 15, 20, 25};
int i, j, k;
i = ++a[1];
j = a[2]++;
```

```
k = a[1]*a[2];
printf("%d, %d, %d", i, j, k);
```

(1) 2, 2, 45 (2) 2, 2, 3 (3) 2, 15, 32 (4) 2, 2, 30

Programming question :
Write a program in C to find the sum of digits of a number using recursion. Make any suitable
assumptions and mention them clearly as comments at the start of your program.

1: What is the output after executing the following (C) code: _____

```
void myAreaFunction(int myArea)
{
     int myArea = 3.14 * myArea * myArea;
}
main()
{
    int myArea = 10;
    myAreaFunction(myArea);
    printf("%d", myArea);
}
```

2: What is the output of the following (C) program? _____

```
void main()
{
    int i = 10;
    {
        int i = 20;
        {
            int i = 30;
        }
        printf("%d", i);
    }
}
```

3: Consider the following piece of (C) code :

```
    char a[10][10], b[10][10], i, j;
    memset(a,0,sizeof(a));
    memset(a,1,10 * sizeof(char));
    memset(a[1],2, 10 * sizeof(char));
    for (i = 0; i < 10; i++) {
        for (j = 0; j < 10; j++) {
            b[i][j] = a[j][i];
        }
    }
```

At the end of execution of the above code :
(1) Matrix **b** is equal to matrix **a** (2) Matrix **b** will be a Null matrix
(3) Matrix **b** is transpose of matrix **a** (4) None of the above

4: What is the output when the following piece of (C) code is executed?

```
int a[5] = {5, 1, 15, 20, 25};
```

```
int i, j, k;
i = ++a[1];
j = a[1]++;
k = a[1] * a[2];
printf("%d, %d, %d", i, j, k);
```

(1) 2, 2, 45 (2) 2, 2, 3 (3) 1, 2, 45 (4) 2, 2, 30

5: Consider the declaration `short myvar[15];`.
What is the output when `printf("%d", sizeof(myvar));` is executed? _____

6: Multiple functions can exchange data between one another using which one of the below?
(1) Function arguments (2) External variables (3) Return values (4) All of the above

7: What is the output when the following piece of (C) code is executed? Answer: _____

```
char a = 127;
a++;
printf("%d", a);
```

8: Variables that come into existence when the function is entered and goes out of scope when it is left are called :
(1) Automatic Variables (2) Global Variables (3) Register Variables (4) External variables

9: What is the output when the following piece of (C) code is executed?

```
char str1[] = "Equal";
char str2[] = "Equal";
if (str1 == str2) printf("Equal");
else printf("Not Equal");
```

(1) Equal (2) Not Equal (3) Error (4) None of these

10: Consider the 2 dimensional array : `char xyz[20][25];`
Assuming that the array is stored starting at address 200, what is the address of `xyz[5][10]`;
Answer: _____

11: Pick the correct statement(s) with respect to (C) language:
I. The body of a function may have many return statements.
II. The body of a function should have only one return statement.
III. If return statement is omitted, then the function does its job but returns no value to the calling environment.
(1) Only I (2) Only II (3) Only III (4) Both I and III

12: Which of the following will give a compilation error?

(1) `int array[5];`
(2) `int array[];`
(3) `int array[5] = {1, 2, 3, 4, 5};`
(4) `int array[5] = {1, 2};`

13: Consider the following (C) program along with the respective program line numbers:

```
10:    int val = 99, testVal = 1;
11:    if ( ! testVal && val++) {
12:        val = 299;
13:    }
```

What is the value of `val` when control comes to line 13? _____

14: If the return type for a function is omitted which of the following is assumed by the compiler:
(1) `char` (2) `float` (3) `int` (4) `void`

15: Consider the following function written in (C) :

```
int value = 0;
int testme(int a)
{
    if (a > 0) return (testme(a-1) * a);
    return 1;
}
```

Which of the followng is true when `value = testme(5);` is executed?
(1) Compilation error (2) `value` has value 0 (3) `value` has value 120 (4) None of the above

16: What is the output when the following piece of (C) code is executed?

```
char name[] = "John\0Doe\0";
printf("%s",name);
```

(1) Garbage value (2) John (3) Doe (4) John\0Doe\0

17: Consider the declaration `char myvar[] = "SeventyEight";`.
What is the output when `printf("%d", sizeof(myvar));` is executed? _____

18: Pick the correct statement(s) with respect to (C) Language:
(I) A source program can span across multiple files
(II) A function cannot span across multiple files
(III) The C preprocessor provides for conditional compilation
(1) Only I (2) Both I and II (3) Both II and III (4) All the above

19: The piece of (C) code : **for (;;) { }** is an example of :
(1) Compilation Error (2) A do-nothing operation (3) Infinite Loop (4) Dummy function

20: Here is an example of a (C) program written by a **careless** programmer.

```
void main() {
    int i, number = -5, value = 10;
    if (number >= 0)
        for (i = 0; i < number; i++)
            if (value == 10)
```

```
            {
                    printf("Value correct");
                    return;
            }
        else
            printf("Error: n is negative");
}
```

What is the output after its execution?
(1) Value correct (2) Error: n is negative (3) Compilation Error (4) None of the above

Programming question :
Write a program in C to calculate the sum of numbers from 1 to n using recursion. Make any
suitable assumptions and mention them clearly as comments at the start of your program.

ESS101 : Programming 1 (C Programming)
Quiz 2 : 16th September, 2019, 3 to 3.30 pm

1: Consider the following function written in (C):

```
int quizQuestion(int arg)
{
    if (arg > 0) return (arg * quizQuestion(arg-1));
    return -1;
}
```

What is the output when `printf("%d", quizQuestion(4));` is executed?
(1) 120 (2) Compilation error (3) 24 (4) None of the above

2: What is the output of the following (C) program? _____

```
void main()
{
    int i = 10;
    {
        int i = 20;
        {
            int i = 30;
        }
    }
    printf("%d", i);
}
```

3: What is the output when the following piece of (C) code is executed?

```
char name[] = "John\0Doe\0";
printf("%d",strlen(name));
```

(1) Garbage value (2) 7 (3) 9 (4) 4

4: What is the output when the following piece of (C) code is executed?

```
char str1[5] = "Equal";
if (str1 != "Equal") printf("Not Equal");
else printf("Equal");
```

(1) Equal (2) Not Equal (3) Error (4) None of these

5: What is the output after executing the following (C) code: _____

```
void myTemparatureConverter(int temp)
{
    temparature = (temparature - 32) * (5/9);
}
main()
{
```

```c
    int temparature = 32;
    myTemparatureConverter(temparature);
    printf("%d", temparature);
}
```

6: Pick the incorrect statement(s) with respect to (C) language:
I. If return statement is omitted in a function, we get compilation error.
II. The body of a function should have only one return statement.
III. The body of a function may have multiple return statements.
(1) Both I and III (2) I only (3) II only (4) Both I and II

7: Consider the 2 dimensional array : `char twoDarray[45][45];`
Assuming that the array is stored starting at address 100, what is the address of `twoDarray[25][15];`
Answer: _____

8: Functions communicate with each other via :?
(1) External variables (2) Return values
(3) Function arguments (4) All of the above

9: Here is an example of a (C) program written by a **careless** programmer.

```c
void main() {
    int i, number = -5, value = 10;
    if (number >= 0)
        for (i = 0; i < number; i++)
            if (value == 10)
            {
                printf("Value correct");
                return;
            }
    else
        printf("Error: n is negative");
}
```

What is the output after its execution?
(1) Value correct (2) Error: n is negative (3) Compilation Error (4) None of the above

10: Consider the following piece of (C) code :

```c
    char a[10][10], b[10][10], i, j;
    memset(a,0,sizeof(a));
    for (i = 0; i < 10; i++) {
        for (j = 0; j < 10; j++) {
            a[i][i] = i * j;
        }
    }
```

At the end of execution of the above code, the matrix **a** will be of type :
(1) Null matrix (2) Diagonal matrix (3) Upper Triangular (4) Lower Triangular

11: Use of functions:
(1) helps to avoid repeating a set of statements many times
(2) enhances the logical clarity of the program
(3) can be used to perform the same set of actions more than once
(4) all of the above

12: What is the output when the following piece of (C) code is executed? Answer: _____

```
    printf("%d", sizeof(char) * sizeof(unsigned char));
```

13: If the return type for a function is omitted which of the following is assumed by the compiler:
(1) `void` (2) `int` (3) `double` (4) `char`

14: What is the output when the following piece of (C) code is executed?

```
int a[5] = {5, 1, 15, 20, 25};
int i, j;
i = ++a[1];
j = a[1]++;
printf("%d, %d, %d", i, j, a[1]);
```

(1) 3, 2, 1 (2) 2, 2, 3 (3) 1, 2, 2 (4) 2, 2, 1

15: Variables that come into existence when the function is entered and goes out of scope when it is left are called :
(1) Static Variables (2) Automatic Variables (3) External Variables (4) Global variables

16: Which of the following will give a compilation error?

```
(1) int array[2][] = {{1,2}, {3,4}};
(2) int array[5] = {-1, -2, -3, -4, -100 };
(3) int array[500];
(4) int array[] = {1, -1};
```

17: Consider the declaration `char myvar[] = "FortyOne";`.
What is the output when `printf("%d", sizeof(myvar));` is executed? _____

18: The piece of (C) code : **for (;1;) { }** is an example of :
(1) Recursive operation (2) A do-nothing operation (3) Compilation Error (4) Infinite Loop

19: Pick the incorrect statement(s) with respect to (C) Language:
(I) A source program cannot span across multiple files
(II) A function can span across multiple files
(III) The C preprocessor provides for conditional compilation
(1) Only I (2) Only II (3) Only III (4) Both I and II

20: Consider the following (C) program along with the respective program line numbers:

```
10:    int val = 1, testVal = 0;
11:    if (testVal && val++) {
12:        val = 0;
13:    }
```

What is the value of `val` when control comes to line 13? _____

Programming question :
Write a program in C to print the array elements using recursion. Make any suitable assumptions and mention them clearly as comments at the start of your program.

1: Consider the 2 dimensional array : `char TestArray[25][20];`
Assuming that the array is stored starting at address 400, what is the address of `TestArray[15][10];`
Answer: _____

2: Which of the following will give a compilation error?

```
(1) int array[5] = {1, 1, 1, 1, 1, 1 };
(2) int array[100] = {1};
(3) int array[5] = {1, 2, 3, 4, 5};
(4) int array[] = {1000, 10000};
```

3: Consider the following piece of (C) code:

```
char a[10][10], b[10][10], i, j;
memset(a, 0, sizeof(a));
for (i = 0; i < 10; i++) {
    for (j = 0; j < 10; j++) {
        a[i][j] = (i < j) ? 0 : i+j;
    }
}
```

At the end of execution of the above code:
(1) Matrix **a** is a lower triangular matrix (2) Matrix **a** is an upper triangular matrix
(3) Matrix **a** is a null matrix (4) None of the above

4: What is the output when the following piece of (C) code is executed?

```
char name[] = "\0John\0Doe\0";
printf("%d",strlen(name));
```

(1) Garbage value (2) 0 (3) 9 (4) 4

5: Pick the incorrect statement(s) with respect to (C) language:
I. The body of a function should have only one return statement.
II. If return statement is omitted in a function, we get compilation error.
III. A return statement MUST ALWAYS be present in a function.
(1) Both I and II (2) Both I and III (3) Both II and III (4) All of the above

6: What is the output when the following piece of (C) code is executed? _____

```
unsigned char charVal = -1;
printf("%d", charVal);
```

7: Which one of the following is the right choice for functions to send data among one another?
(1) Return values (2) Function arguments
(3) External variables (4) All of the above

8: What is the output when the following piece of (C) code is executed?

```
char str1[] = "Equal";
if (str1 == "Equal") printf("Equal");
else printf("Not Equal");
```

(1) Equal (2) Not Equal (3) Error (4) None of these

9: Here is an example of a (C) program written by a **careless** programmer.

```
void main() {
    int i, number = -5, value = 10;
    if (number >= 0)
        for (i = 0; i < number; i++)
            if (value == 10)
            {
                printf("Value correct");
                return;
            }
    else
        printf("Error: n is negative");
}
```

What is the output after its execution?
(1) Value correct (2) Error: n is negative (3) Compilation Error (4) None of the above

10: What is the output after executing the following (C) code: _____

```
void myTestFunction(int myValue)
{
    myValue = myValue * 100;
}
main()
{
    int myValue = 55;
    myTestFunction(myValue);
    printf("%d", myValue);
}
```

11: Consider the following function written in (C):

```
int functionTest(int a)
{
    if (a > 0) return (functionTest(a-1) + a);
    return 0;
}
```

What is the output when `printf("%d", functionTest(10));` is executed?
(1) 55 (2) Compilation error (3) 120 (4) None of the above

12: What is the output of the following (C) program? _____

```
void main()
{
    int i = 10;
    {
        int i = 20;
        {
            int i = 30;
        }
        printf("%d", i);
    }
}
```

13: What is the output when the following piece of (C) code is executed? _____

```
int a[5] = {5, 1, 15, 20, 25};
int i, j, k;
i = ++a[1];
j = a[2]++;
k = a[1]*a[2];
printf("%d, %d, %d", i, j, k);
```

(1) 2, 2, 45 (2) 2, 2, 3 (3) 2, 15, 32 (4) 2, 2, 30

14: The piece of (C) code : **for (;0;) { }** is an example of :
(1) Infinite Loop (2) Compilation Error (3) A do-nothing function (4) A no-operation segment

15: If the return type for a function is omitted which of the following is assumed by the compiler:
(1) `int` (2) `float` (3) `void` (4) `long`

16: Variables that come into existence when the function is entered and goes out of scope when it is left are called :
(1) Register Variables (2) External Variables (3) Global Variables (4) Automatic variables

17: Consider the declaration `unsigned short myvar[40];`.
What is the output when `printf("%d", sizeof(myvar));` is executed? _____

18: Consider the declaration `char myvar[] = "Twentynine";`.
What is the output when `printf("%d", sizeof(myvar));` is executed? _____

19: Consider the following (C) program along with the respective program line numbers:

```
10:    int val = 10, testVal = 1;
11:    if (testVal || val++) {
12:        val = 50;
13:    }
```

What is the value of `val` when control comes to line 13? _____

20: Pick the correct statement(s) with respect to (C) Language:
(I) The C preprocessor provides for conditional compilation

(II) A function can span across multiple files
(III) A source program can span across multiple files
(1) Only I (2) Both I and III (3) Only II (4) Only III

Programming question :
Write a program in C to find the sum of digits of a number using recursion. Make any suitable assumptions and mention them clearly as comments at the start of your program.