Roll No.

COMPUTER SCIENCE AND ENGINEERING

Semester I

CS6101 Programming with C

(Regulation 2018 - RUSA)

Time: 3 Hours   Answer ALL Questions   Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. What is the exact command you need to type to copy a file A to a file B?(Or the exact steps you need to take, if a mouse is used.)

2. Give examples to show the difference between "<" and "<=" operators.

3. What does the following print:
```
int i=5;
if (i>3)
printf("i > 3\n");
else;
printf("i <= 3\n);
```

4. Write the while loop which will count the number of occurrences of a given integer "m" in an integer array which has "n" integers. (All the other statements needed for a complete program can be assumed to be there.)

5. What is the value in variable n after the following:
```
#define SIZE 5
int n = SIZE;
```

6. Consider the following program segment. What will be the value of k.
```
int a[3];
int k, *p;
a[0]=1;
a[1]=2;
a[2]=3;
p=a;
k = *(p+1);
```

7. Declare a structure to store student roll number, age, mark in mathematics, physics and chemistry.

8. What is the function which has to be used before you use the function fread to read from a file.?

9. Give examples of postfix and prefix operators.

10. Give an example of using #include.

11. (i) What are the different keys which are used while editing a C program and what does each one do? (4 marks)

(ii) Describe the connection between a variable and a memory address. (4 marks)

12. (i) Write a complete C program which accepts an integer from the user, adds 2 to it, and displays both the values. Use appropriate messages. (4 marks)

 (ii) Explain what the operators / and % do on integers. Show what happens for specific examples of two integer variables i and j in the following statements given below. What is the expression you will use to get back the value of i, given m,r and j.

int i,j,m,r;

m=i/j;

r=i%j;

13. (i) What is the difference between `while` and `do-while`? Give an example and explain the difference. (4 marks)

(ii) Show, using an example, how an `enum` can be used instead of a `#define`. (4 marks)

14. (i) Write the program statements to do the following: Declare an array of 3 integers. Put a value into each integer element of the array. Display the 3 elements using a single printf.

(ii) Write the program statements to do the following: Declare a char array, put some example characters 'a', 'b', 'c', and then the null character ('\0'). What will happen when you use `printf("s");`

15. (i) What values are printed in the following program segment:

```
void main()
{
    int i,j;
    i = 5;
    j = 6;
    k = add(i,j);
    printf("%d, %d, %d\n",i,j,k);
}
add(i,j)
{
    int i;
    int j;
    i=i+j;
    j=i-j;
    return (i+j);
}
```

  (ii)

What happens in the following program segment:

```c
void main()
{
    int i,j;
    i = 5;
    j = 6;
    mul(i,j,k);
    printf("%d, %d, %d\n",i,j,k);
}
mul(i,j)
{
    int i,j,k;
    k=i*j;
    return (i+j);
}
```

16. (i) Declare small arrays of int, and char. Declare pointers int * p, char *q. Fill the arrays with appropriate example values. Initialise p and q to the arrays. What will be the type of value displayed by *p and *q. What will be displayed for *(p+1) and *(q+1).

(ii) Find the length of a given string. Use malloc to allocate space. Copy the characters of an existing string to this allocated space and print both strings. What should be the size requested to malloc?

17. (i) Declare an array of structures, where each structure has student registration number, day, month and year of birth. Get input from the user and fill the array. Find the number of students who were born in a given year.

(ii) Give examples of union and structure and show the difference in their usage.

18. (i) What is the program after the preprocessor is used.

```c
#define DEBUG
#ifdef DEBUG
printf("In function deploy\n");
#endif
#ifdef OPTIMIZE
a++;
#endif
```

(ii) Get the names of two files through command line arguments. Compare the two files and display whether they are the same or different.

19. (i) What is displayed after the following statement:

```c
i=3;
printf ("Result: %d\n", (i>0) ? 1 : 0);
```

(ii) Give examples which show the difference between the break and the continue statements.

20. (i) Write a program to multiply the corresponding elements of two arrays and put into a third array. Display the contents of the three arrays.

(ii) What is displayed in the following

```
i=5;
printf("Factorial of %d is %d\n",i, fact(i));
```

where the function fact is

```
fact(int i)
{
    if (i>1)
        return(i*fact(i-1));
    else
        return(1);
}
```

PART – C (2 x 8 = 16 marks)

21. (i) Find any four errors in the following program. (4 marks)

```
#include (stdio.h)
void main()
{
    integer i;
    i = 5
    printf ("The value of the integer is %d\n, i);
}
```

(ii) What error is displayed for the following sets of statements (4 marks)
```
int i,i;
```

and
```
int i;
j=5;
```

22. (i) Write a complete C program to get an integer from the user and display whether it is positive or negative. (4 marks)

(ii) Write a complete C program to get positive integers as input from a user and put into an array. Stop getting the input when it is a negative number. Display the numbers in reverse order.