Roll No. .....

TCS–101

B. TECH. (FIRST SEMESTER)

END SEMESTER EXAMINATION, Jan., 2023

FUNDAMENTALS OF COMPUTER AND INTRODUCTION TO PROGRAMMING

Time : Three Hours

Maximum Marks : 100

Note : (i) All questions are compulsory.

(ii) Answer any *two* sub-questions among (a), (b) and (c) in each main question except Question 2.

(iii) Question **2** is compulsory for all.

(iii) Total marks in each main question are **twenty**.

(iv) Each sub-question carries 10 marks.

1. (a) Define Operating System. Explain various functions of operating system. Also describe GUI and CUI. (CO1)

(b) Explain the memory hierarchy. What do you mean by primary and secondary memory ? Differentiate RAM and ROM. (CO1)

P. T. O.

(c) What do you understand by Computer Network ? Explain different kinds of networks. And also discuss the advantages of Computer Network. (CO1)

2. Find output of following codes : (CO2, CO4, CO5, CO6)

(a) int main( )

```
{
    int x=49;
    for (;x;)
    x--;
    printf("%d",x);
    return );
}
```

(b) int main( )

```
{
    int x;
    float y;
    y = x = 7.5;
    printf("%d %f", x, y);
    return 0;
}
```

(c)
```
int main( )
{
    int i = 0, j = 0;
    while (i < 5, j < 10)
    {
        i++
        j++;
    }
    printf("%d, %d\n", i, j);
    return 0;
}
```

(d)
```
int main( )
{
    int i = 2;
    {
        int i = 4, j = 5;
        printf("%d %d", i, j);
    }
    printf("%d %d", i, j);
    return 0;
}
```

(e) int main( )

```
{
    int a = 32;
    do
    {
        printf(" %d", a);
        a++;
        if(a > 35)
            break;
    }while(1);
}
```

(f) How many times while loop condition is tested in the following C code snippets, if i is initialized to 0 ?

```
do
{
  i++;
} while (i <= n);
```

(g) int main( )

```
{
    int a[4]={1,5};
    printf("%d",[3]);
    return 0;
}
```

(h)
```
void f(int const i)
{
    i=5;
}
int main( )
{
    int x = 10;
    f(x);
}
```

(i)
```
void solve(int x)
{
    if(x == 0)
    {
        printf" %d ", x);
        return;
    }
    prinft(" %d ", x);
    solve(x – 1);
    printf(" %d ", x);
}
int main( )
{
    solve(3);
    return 0;
}
```

(j)
```
void check( )
{
    int ch = 2;
    switch(ch)
    {
       case 1: printf("1 ");
       case 2: printf("2 ");
       case 3: printf("3 ");
       default: printf("None");
    }
}
int main( )
{
    check( );
    return 0;
}
```

3. (a) Define Following with example : (CO3, CO4)

   (i) Ladder if-else *vs.* Switch case

   (ii) Entry controlled loop *vs.* Exit controlled loop

   (iii) Break *vs.* Continue

   (iv) Automatic storage class *vs.* Static storage class

   (b) Draw a flowchart to input n positive integers from user. Calculate and print sum of all even numbers and all odd numbers separately. (CO3, CO4)

(c) Write a C program to input a positive integer and print it into words. (CO3, CO4)

Sample Input : 2194

Sample output : Two One Nine Four

4. (a) Define array. Explain various merits and demerits of array. What do you understand by static memory allocation ? (CO3, CO5)

(b) Draw a flowchart to input n integer elements into an array and replace all elements with their sum of digits. (CO3, CO5)

(c) Write a C program to input integer elements into a 2D array of size m×n. Find and print minimum element of each row. (CO3, CO5)

5. (a) Explain advantages of functions. What do you understand by function prototype, function calling and function definition with the help of example. (CO6)

(b) Write a recursive function in C to find sum of following series : (CO6)

$1 + x^2 + x^4 + x^6 + \ldots\ldots\ldots x^n$ (where n is an even number)

(c) Write a menu driven program for following calculation and create separate user define function for each case : (CO6)

(i) Find factorial of an inputted number.

(ii) Calculate x^y without using pow( ).