Roll No. .....

TCS–101

B. TECH. (FIRST SEMESTER)

MID SEMESTER EXAMINATION, Nov., 2022

FUNDAMENTAL OF COMPUTER AND INTRODUCTION TO C PROGRAMMING

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any ***one*** of the sub-questions.

(ii) Each sub-question carries 10 marks.

1. (a) Explain Von Neumann architecture of computer with a neat diagram. (CO1)

OR

(b) Define the following : (CO1)

(i) Utility software

(ii) Cache memory

(iii) Tracks and sectors

(iv) Mesh and ring topology

P. T. O.

2. (a) Find the following output with explanation : (CO1, CO2, CO3, CO4)

(i)
```
#include<stdio.h>
    int main( )
    {
        int k = 0;
        for(k)
printf("Hello");
        return 0;
    }
```

(ii)
```
#include<stdio.h>
        int main( )
        {
            int a = –5;
            if(!(a*–1))
        printf("success");
            else
        printf("Failure");
        return 0;
            }
```

(iii)
```
#include<stdio.h>
    int main( )
    {
        int i=5; j=3, k=–2, z;
        z= !(i&&j| |k);
printf("%d",z);
        return 0;
    }
```

(iv)
```
#include <stdio.h>
int main( )
{
   int z;
   z = 4*6/3–12*5.2%4–8;
printf("%d", z);
   return 0;
}
```

(v) 6 GB = ... bits.

OR

(b) Find the following output with explanation : (CO1, CO2, CO3, CO4)

(i)
```
#include <stdio.h>
  int main( )
  {
     int a=0;
  if(a=1)
printf("You won");
   else
print("You loose");
return 0;
  }
```

(ii)
```
#include <stdio.h>
int main( )
{
    int a=5;
    switch(a)
    {
        case 0 :
printf("0");
        case 3 :
 printf("3");
        case 5 :
printf("5") ;
        default:
printf("RABBIT");
    }
```

(iii)
```
#include <stdio.h>
int main( )
{
   int i=5;
   while(i>0)
printf("%d",i);
i–=1;
    return 0;
   }
```

(iv)
```
#include <stdio.h>
int main( )
{
int i=5;, j=3, k=–2, l=5, z;
z= – –i *– –j*– –l*++k;
printf("%d",z);
return 0;
}
```

(v) 32 MB = ... nibble.

3. (a) Explain different phases involved in compilation of a C program. (CO2)

OR

(b) What do you mean by unary, binary and ternary operators ? Explain operator precedence and associativity. Apply it in the following expression and calculate : (CO2)

(i) $8 + 3 - 6 * 7 / 4 > 7 / 3 * 5$

(ii) $5 * 7 + 3 \&\& 9 < 10 - 8 * 4$

4. (a) Draw a flowchart to input two positive integer numbers, calculate the difference of their squares and square of their difference. Print the largest of two results obtained. (CO3)

OR

(b) Draw a flowchart to input a positive integer number than print the sum of cubes of the factors of that number. For example : (CO3)

$N = 12$

$Sum = 1^3 + 2^3 + 3^3 + 4^3 + 6^3 = 316$

5. (a) Write a C program to calculate final train fare after applying the following conditions : (CO4)

(i) If passenger is male/female and age is > = 6, then discount = 50%.

(ii) If passenger is female and age between 12 to 65, then discount = 20%.

(iii) If passenger age is between 5 to 12, then discount = 75%.

(iv) If passenger age is less than 5, then discount = 100%.

OR

(b) Write a C program to calculate the sum of the following series : (CO4)

$$10 + x + x^2 + x^3 + x^4 + \ldots\ldots x^n$$

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