Roll No. | | | | | | | |

Paper Code: TCS101

B. Tech End Semester Examination 2017

First Semester

FUNDAMENTAL OF COMPUTERS AND INTRODUCTION TO C PROGRAMMING

Time: Three Hours

MM: 100

Note:

(i) This question paper contains five questions.
(ii) All questions are compulsory.
(iii) Instructions on how to attempt a question are mentioned against it.
(iv) Total marks assigned to each question are twenty.

Q1. (Attempt any two questions of choice from a, b and c) **(2X10=20 Marks)**

a. Predict the output of following code: (assume 16 bits compiler)

(i) **3 Marks**

```
main()
{
int i=0;
for( ;i<20;i++)
  {
        switch(i)
        {
              case 0:i+=5;
              case 1:i+=2;
              case 5:i+=5;
              default:i+=4;
              break;
        }
        printf("%d\n",i);
  }
}
```

(ii) **3 Marks**

```
main()
{
int a,b,c,d;
a=b=c=d=5;
a*=b+1;
c+=d*=3;
printf("%d%d",a,c);
}
```

(iii) 4 Marks

```
int reset(void);
int ret10(void);
main()
 {
   auto int i = 0;
   printf("%d\n",i);
         {
         int i = 2;
         printf("%d\n",i);
               {
               i+=1;
               printf("%d\n",i);
               }
         printf("%d\n",i);
         }
   printf("%d\n",i);
   printf("%d\n",reset());
   printf("%d\n",ret10());
```

```
 printf("%d\n",reset());
 printf("%d\n",ret10());
 }
int reset()
{
 int j = 0;
 return(j);
 }
int ret10()
{
 static int i = 10;
 i+=1;
 return(i);
}
```

b (i) Explain computer memory hierarchy with help of block diagram. **(5 Marks)**
(ii) Explain translators in programming languages? **(5 Marks)**

c. Draw a flowchart to find sum of following series:

$1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \ldots$ up to n terms

Q2. (Attempt any two questions of choice from a, b and c) **(2X10=20 Marks)**

a. Show different phases (compilation steps) in life of a C program using a neat and full page block diagram also mention all the Text and Binary files generated during these phases.
b. Draw a flowchart and write a C program to calculate x^y without using pow() function.
c. Short notes on following: **(4 x 2.5 Marks=10 Marks)**
(i). Macro functions
(ii). Constant and symbolic constant
(iii). Type conversion in C
(iv). Rules for a valid identifier

Q3. (Attempt any two questions of choice from a, b and c) **(2X10=20 Marks)**
a. Write a C program to print following pattern using **for loop**:

```
    *
   ***
  *****
 *******
```

Upto n line

b. Differentiate between entry control and exit control loops in C, Write a C program to print square of n random numbers inputted by user. (5 Marks+ 5 Marks)
c. What are the advantages and limitations of switch over if-else ladder? Predict the output of following: **(5+2.5+2.5)**

```
int main()
{
int i=0;
while(i<10)
{    i++;
     if(i==3)
     continue;
     printf("%d",i);
}
return 0;
}
```

```
void main()
{
   int i = 0, j = 0;
   for (i = 0;i < 3; i++)
   {
      for (j = 0;j < 3; j++)
      {
         if (i > 1)
            break;

         printf("Hello \n");
      }
      printf("Hi \n");
   }
}
```

Q4. (Attempt any two questions of choice from a, b and c) (2X10=20 Marks)

a. Explain memory layout of a C program with help of block diagram that shows different areas of C program memory and where different types of variables are stored.

b. Write a C program having a function find prime that returns 1 if its argument is a prime number and returns 0 otherwise. (Without function 5 marks will be deducted)

c. Give some key difference between Recursion and Iteration. Write a C program to find sum of a digits of a given number using recursion.

Q5. (Attempt any two questions of choice from a, b and c) (2X10=20 Marks)

a. Explain Short circuiting related to logical operators in C. Predict the output of following: (5+5)

```
int main()
{
        int i = 0;
        int a=5, b=6;
        if (a/b && (++i < 50)) {
         printf("Short Circuit and Logical AND\n");
         printf("%d\n",i);
        }
        if (b/a || (++i < 50)) {
           printf("Short Circuit and Logical OR\n");
                printf("%d\n",i);
        }
return 0;
}
```

b. Explain any 6 categories of operators in C with example. (10 marks)

c. Predict the output of following code: (assume 16 bits compiler) (5 x 2 Marks= 10 Marks)

(i)
```
int main()
{
        extern int i;
        i=20;
        printf("%d\n",sizeof(i));
        return 0;
}
```

ii)
```
int main()
{
        int a;
        a = (1,45,012);
        printf("%d", a);
        return 0;
}
```

iii)
```
int main()
{
        int a= 0;int b = 20;char x =1;char y
        =10;
        if(y,b,x,a)
        printf("hello");
        else
        printf("goodbye");
        return 0;
}
```

iv)
```
int main()
{
int i=-3, j=2, k=0, m;
m = ++i && ++j && ++k;
printf("%d, %d, %d, %d\n", i, j, k, m);
return 0;
}
```

(v) Predict value of z1 and z2.
```
int i=3, j=3, k=4, m=1;
z1=i++ - j--;
z2=++k % -- m;
```