INDAC ASSIGNMENT 6-C PROGRAMMING

What is printed by the following program?

```
int m = 100';
int * p1 = &m;
int **p2 = &p1;
printf("%d", **p2);
```

ANS=100

What is the output of the following segment?

```
int m[2];
*(m+1) = 100;
*m = *(m+1);
printf("%d", m [0]);
```

ANS=100

What is the output of the following program?

```
int f(char *p);
main ( )
{
      char str[ ] = "ANSI";
      printf("%d", f(str) );
}
int f(char *p)
{
      char *q = p;
      while (*++p)
            ;
      return (p-q);
}
```

ANS IS 4,THAT IS MEMORY ALLOCATION FOR INT IS SUBTRACTED and p=-1065274073 q=-1065274077,that memory address is keep on changing.

ASSIGNMENT 6

1)Write a program to read n elements to an array and print those elements using pointer to an array

```
#include <stdio.h>
void disp( int *num)
{
    printf("%d ", *num);
}

int main()
{
     int arr[] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 0};
     for (int i=0; i<10; i++)
     {
         /* Passing addresses of array elements*/
         disp (&arr[i]);
     }

     return 0;
}
```

Output:

2)Write a program to read an employee number ,name, age ,salary and print details using structure

/*C program to read and print employee's record using structure*/

```
#include <stdio.h>

/*structure declaration*/
struct employee{
    char    name[30];
    int     empId;
    float   salary;
    int age;
};

int main()
{
    /*declare structure variable*/
    struct employee emp;

    /*read employee details*/
    printf("\nEnter details :\n");
    printf("Name ?:");          gets(emp.name);
    printf("ID ?:");            scanf("%d",&emp.empId);
    printf("Salary ?:");        scanf("%f",&emp.salary);
     printf("Age ?:");            scanf("%d",&emp.age);

    /*print employee details*/
    printf("\nEntered details are:");
    printf("Name: %s"   ,emp.name);
    printf("Id: %d"     ,emp.empId);
```

```
    printf("Salary: %f\n",emp.salary);
     printf("Age: %d"     ,emp.age);

    return 0;
}
```

3)Repeat the above pgm and show **dob** with day, month and year of employee with nested structure.

```
#include <stdio.h>

/*structure declaration*/
struct employee{
    char    name[30];
    int     empId;
    float   salary;
    int age;
      struct dateofbirth{
      int date;
      int month;
      int year;
      }DOB;
};

int main()
{
    /*declare structure variable*/
    struct employee emp;

    /*read employee details*/
    printf("\nEnter details :\n");
    printf("Name ?:");          gets(emp.name);
    printf("ID ?:");            scanf("%d",&emp.empId);
    printf("Salary ?:");        scanf("%f",&emp.salary);
     printf("Age ?:");            scanf("%d",&emp.age);

    /*print employee details*/
    printf("\nEntered details are:");
    printf("Name: %s"   ,emp.name);
    printf("Id: %d"     ,emp.empId);
    printf("Salary: %f\n",emp.salary);
     printf("Age: %d"     ,emp.age);
printf("Enter Date of Birth [DD MM YY] format: ");
scanf("%d",&emp.DOB.date);
scanf("%d",&emp.DOB.month);
scanf("%d",&emp.DOB.year);
printf(" \nDate of birth : %d/%d/%d\n",emp.DOB.date,emp.DOB.month,emp.DOB.year);
return 0;
}
```

4)4. Write a program to find sum of 2 numbers using structure

```
   #include <stdio.h>
#include<string.h>
/*structure declaration*/
```

```
struct sumof2
{

  int a;
    int b;
};

int main ()
{
  /*declare structure variable */
  struct sumof2 sum;

  /*read employee details */

  printf ("enter a ?:");
  scanf ("%d", &sum.a);
  printf ("enter b ?:");
  scanf ("%d", &sum.b);
  printf("sum of a and b = %d",sum.a+sum.b);
   return 0;
}
```

5)Write a program to find biggest of 3 numbers using structure

```
#include <stdio.h>
#include<string.h>
/*structure declaration*/
struct sumof2
{

  int a;
```

```
    int b;
    int c;
};

int main ()
{
  /*declare structure variable */
  struct sumof2 sum;

  /*read employee details */
  int d;
  printf ("enter a ?:");
  scanf ("%d", &sum.a);
  printf ("enter b ?:");
  scanf ("%d", &sum.b);
   printf ("enter c ?:");
  scanf ("%d", &sum.c);
   d= (sum.a>sum.b && sum.a>sum.c)? sum.a:
(sum.b>sum.a && sum.b>sum.c)? sum.b:sum.c;

 printf("greatest of a,b and c is = %d",d);
   return 0;
}
```

6)Write a program using pointers to compute the sum of all elements stored in an array

```
#include<stdio.h>
int main()
{
   int array[5];
   int i,sum=0;
   int *ptr;

   printf("\nEnter array elements (5 integer values):");
   for(i=0;i<5;i++)
      scanf("%d",&array[i]);
```

```
   /* array is equal to base address
    * array = &array[0] */
   ptr = array;

   for(i=0;i<5;i++)
   {
      //*ptr refers to the value at address
      sum = sum + *ptr;
      ptr++;
   }

   printf("\nThe sum is: %d",sum);
}
```

Output:

```
Enter array elements (5 integer values): 1 2 3 4 5
The sum is: 15
```

Method 1: Sum of array elements using Recursion: Function calling itself

#include<stdio.h>

```
int main()
{
   int array[] = {1,2,3,4,5,6,7};
   int sum;
   sum = sum_array_elements(array,6);
   printf("\nSum of array elements is:%d",sum);
   return 0;
}
int sum_array_elements( int arr[], int n ) {
   if (n < 0) {
     //base case:
     return 0;
   } else{
     //Recursion: calling itself
     return arr[n] + sum_array_elements(arr, n-1);
    }
}
```

8. Write a function using pointers to exchange the values stored in two locations in the memory

#include<stdio.h>

```
void swap(int *num1, int *num2) {
  int temp;
  temp = *num1;
  *num1 = *num2;
  *num2 = temp;
}

int main() {
```

```
  int num1, num2;

  printf("\nEnter the first number : ");
  scanf("%d", &num1);
  printf("\nEnter the Second number : ");
  scanf("%d", &num2);

  swap(&num1, &num2);

  printf("\nFirst number  : %d", num1);
  printf("\nSecond number : %d", num2);

  return (0);
}
```

7)Write a program using pointers to determine the length of a character string.

```
1  #include<stdio.h>
   #include<conio.h>
2
3  int
   string_ln(char*);
4
5  void main() {
6     char str[20];
      int length;
7
8
      printf("\nEnter
9  any string : ");
10    gets(str);
11
      length =
12 string_ln(str);
13    printf("The
   length of the given
14 string %s is : %d",
15 str, length);
16    getch();
   }
17
18 int
   string_ln(char*p) /
19 * p=&str[0] */
20 {
      int count = 0;
21    while (*p != '\0')
```

```
22
23  {
        count++;
24      p++;
25    }
    return count;
26  }
27
```

assignment2:

Given the values of the variables x, y and z, write a program to rotate their values such that x has the value of y, y has the value of z, and z has the value of x.

Write a program that reads a floating-point number and then displays the right-most digit of the integral part of the number.

Modify the above program to display the two right-most digits of the integral part of the number.

```
1)#include<stdio.h>
int main()
{
int x,y,z;
```

Given three values, write a program to read three values from keyboard and print out the largest of them without using **if** statement.

Write a program to read two integer values m and n and to decide and print whether m is a multiple of n.

Write a program to read three values using **scanf** statement and print the following results:

(a) Sum of the values
(b) Average of the three values
(c) Largest of the three
(d) Smallest of the three

The cost of one type of mobile service is Rs. 250 plus Rs. 1.25 for each call made over and above 100 calls. Write a program to read customer codes and calls made and print the bill for each customer.

7)

```
int n;
scanf("%d",&n);
printf("Total Call duration in minutes=%d\n",n);
int sum=0;
if(n<=100)
        {sum=250*n;
        }
else
        {sum=(100*250)+((n-100)*251.25);
        }
printf("\n*******for first 100 minutes each minute costs =Rs.250  **********\n");
printf("\n*******for minutes exceeding 100,each minute costs =Rs.250+1.25  *******\n");
printf(" \nSo the Total bill to be paid for %d minutes is %d\n",n,sum);
}
```

==========

4))

```
int main()
{int x,y,z;
scanf("%d %d %d",&x,&y,&z);
printf("x=%d \t y=%d\t z= %d\n",x,y,z);
if(x>y)
{       if(x>z)
                { printf("x is larger val=%d\n",x);
```

```
                }
        else
                { printf("z is larger val=%d\n",z);
                }
}
else if(y>z)
        { printf("y is larger val=%d\n",y);
        }
else
        { printf("z is larger val=%d\n",z);}
}
```

==========

5)

```
int x,y;
scanf("%d %d ",&x,&y);
printf("x=%d \t y=%d\t \n",x,y);
//to check y is multiple of x or not
if(y%x==0)
{       printf("y=%d is a multiple of x=%d",y,x);
}
}
```

==========

6)

```
int main()
{
int x,y,z;
scanf("%d %d %d",&x,&y,&z);
printf("x=%d \t y=%d\t z= %d\n",x,y,z);
printf("sum=%d\n",x+y+z);
```

DEBUGGING EXERCISES

What is the error, if any, in the following segment?

```
int x = 10 ;
float y = 4.25 ;
x = y%x ;
```

What is the error in each of the following statements?

(a) if (m == 1 & n ! = 0)
    printf("OK");

(b) if (x = < 5)
    printf ("Jump");

Find errors, if any, in the following assignment statements and rectify them.

(a) `x = y = z = 0.5, 2.0. –5.75;`

(b) `m = ++a * 5;`

(c) `y = sqrt(100);`

(d) `p * = x/y;`

(e) `s = /5;`

(f) `a = b++ –c*2`

1):4: error: invalid operands to binary % (have ‘float’ and ‘int’)
x=y%x;

2)

Assignment 5

1.Write a function prime that returns 1 if its argument is a prime number and returns zero otherwise

```
#include<stdio.h>
int prime(int);
int main()
{
int n,p;
scanf("%d",&n);
p=prime(n);
if(p==1)
{printf("%d is prime\n",n);}
else
{printf("%d is not prime\n",n);}

}
```

```
int prime(int n)
{
int i;
for(i=2;i<n;i++)
{       if(n%i==0)
                return 0;
}
return 1;

}
```

2. Develop a modular interactive program using functions that reads the values of three sides of a triangle and displays either its area or its perimeter as per the request of the user. Given the three sides a, b and c

```
#include<stdio.h>
#include<math.h>
double area(double,double,double);
double perimeter(double,double,double);
int main()
{

double x,y,z;
scanf("%lf %lf %lf",&x,&y,&z);
printf("x=%lf \t y=%lf\t z= %lf",x,y,z);
int n;
scanf("%d",&n);
printf("%d",n);

up:switch(n)
{       case(1):
                printf("area of the triangle is %lf",area(x,y,z));
                break;
        case(2):
                printf("perimeter of the triangle=%lf",perimeter(x,y,z));
                break;
        default:
                printf("choose the right option");
                goto up;
                break;

}
}
double area(double a,double b,double c)
{ double s,i;
```

```
double area;
s=(a+b+c)/2;
i=(s*(s-a)*(s-b)*(s-c));
area=pow(a,0.5);
return area;
}
double perimeter(double a,double b,double c)

{ return a+b+c;
}
```

3. Write a function exchange to interchange the values of two variables, say x and y. Illustrate the use of this function, in a calling function. Assume that x and y are defined as global variables.

```
#include<stdio.h>

int swap(int x,int y)
{

int temp;
temp=y;
y=x;
x=temp;
printf("the swapped values of x and y are=%d and %d",x,y);
}
int main()
{
int x,y;
scanf("%d%d ",&x,&y);
printf("x=%d \t y=%d\t \n",x,y);
swap(x,y);
}
```

5. Write a function that receives a floating point value x and returns it as a value rounded to two nearest decimal places. For example, the value 123.4567 will be rounded to 123.46

```
#include<stdio.h>
int main()
{


 float s=567.7667;
printf(" rounded off to 2 decimal places %f\n",s);
printf(" rounded off to 2 decimal places %.2f\n",s);
}
```

6. In preparing the calendar for a year we need to know whether that particular year is leap year or not. Design a function leap( ) that receives the year as a parameter and returns an appropriate message.

```
#include<stdio.h>

void leap(int);

int main(){

int year;
scanf("%d",&year);

leap(year);
}

void leap(int year)

{
if(year%4==0 && year%100!=0)
        printf("%d is a leap year",year);

else if(year%100==0 && year%400==0)
        printf("%d is a leap year",year);
else
        printf("%d not a leap year",year);
}
```

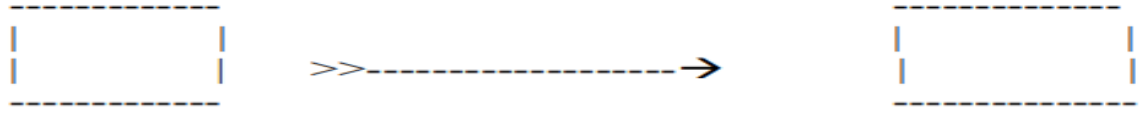
7. Write a function that takes an integer parameter m representing the month number of the year and returns the corresponding name of the month. For instance, if m = 3, the month is March

```
#include<stdio.h>
int main()
{
up:
{
int n;
printf("enter the num of the month=");
scanf("%d",&n);
```

```
switch(n)
{       case(1):
                printf("january");
                break;
        case(2):
                printf("february");
                break;
        case(3):
                printf("march");
                break;
        case(4):
                printf("april");
                break;
        case(5):
                printf("may");
                break;
        case(6):
                printf("june");
                break;
        case(7):
                printf("july");
                break;
        case(8):
                printf("august");
                break;
        case(9):
                printf("september");
                break;
        case(10):
                printf("october");
                break;
        case(11):
                printf("november");
                break;
        case(12):
                printf("december");
                break;
        default:
                printf("ERROR!!!!!  The month num you have chose doesn't exist. CHOOSE
WISELY  \n");
                goto up;
}
}
}
```

Assignment 1

Write a program that will print the following figure using suitable characte



```
int main()
{
printf("\n--------- \n");

printf("|\t|\n");
printf("|\t|\n");

printf("--------- \n");
}
```

a) **Declare x and y as integer variables and z as a short integer variable.**
b) **Assign two 6 digit numbers to x and y.**
c) **Assign the sum of x and y to z.**
d) **Output the value of x, y and z.**

Comment on the output.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
int main()
{
int x=123456;
int y=123456;
short int z=x+y;
printf("%i" z);
```

Distance between two points (x1,y1) and (x2,y2) is governed by the formula

$$D^2 = (x_2-x_1)^2+(y_2-y_1)^2$$

Write a program to compute D given the coordinates of the points.

```
#include<stdio.h>
#include<math.h>

int main()
```

```
{
    float x1, y1, x2, y2, distance;

    printf("Enter point 1 (x1, y1)\n");
    scanf("%f%f", &x1, &y1);

    printf("Enter point 2 (x2, y2)\n");
    scanf("%f%f", &x2, &y2);

    distance = sqrt( (x2 - x1)*(x2 - x1) + (y2 - y1)*(y2 - y1) );

    printf("Distance between (%0.2f, %0.2f) and (%0.2f, %0.2f) is %0.2f\n", x1, y1, x2, y2,
distance);

    return 0;
}
```