NSBM

C Sample Paper

Answer All Questions **Time: 03Hrs**

1.

A. Write the outputs of each of the following expression.
Note: p , q , r are integer variables and initial value of p is 10 and q is 3

a) r=p++ + q ++;
printf("%d",r);

b) r=p-- % q;
printf("%d",r);

c) r= --p / --q;
printf("%d",r);

d) r = ++p * q ++;
printf("%d",r);

(4 marks)

B. Allow the user to input 2 integer values x and y. Program should calculate and display power as the output.

E.g. If user input x=5 and y=3 system will display output (x^y) as 125

(6 marks)

C. Answer the following:

a) What is the general format of a 'for loop', on which occasions you can use a 'for loop'?
b) Write a single printf statement to display the values of an integer X and float variable Y.
c) Declare and assign values for four different variables with four different data types.
d) What are the assignment operators and when we can use them?
e) Explain the general format and the use of a 'switch' conditional structure.

(2 x 5 = 10 marks)

2.

A. In C language functions can be written in four different ways. Use **adding 2 numbers (Calculating the sum)** as an example and write four different functions to explain the behavior and use four different function types. (Function and the main method)

(8 marks)

B. Create a function to provide three integers as parameters to a function and find and return the highest number. Input 3 numbers in the main function, call the function and display the highest number.

(6 marks)

C. Compare and contrast the differences between 'recursion' vs. 'iteration'. You can use a sample program to explain the answer.

(6 marks)

3.

A. Write a single C program to perform the following tasks;

I. Input 10 float values and store them in an array
(4 marks)

II. Display the values of the above array
(4 marks)

III. Find and display the minimum value
(4 marks)

B. Write a C program to declare a multi-dimensional array with the size of 3 x 4. Input values to the array and display the average value.
(8 marks)

Revision.

* Refer operators lesson

26/02/2019

C - Sample Paper (18.2)

p = 10 ; q = 3

(A) a.) r = p++ + q++
= 10 + 3
= 13

p++ (post increment) doesn't change
++p (pre increment changes)

b) r = p-- % q
= 10 % 3
= 1

% modulus

/ divide (quotient)

c) r = --p / --q
= 9 / 2
= 4 (it cannot be 4.5 because datatype is int

5.
2 11
10 10
10 0

d) r = ++p * q++
= 11 * 3
= 33

(B)
```
#include <stdio.h>
int main() {
    int x, y, c, power = 1;
    printf("Enter value for x and y");
    scanf("%d %d", &x, &y);

    for (c=1; c<=y; c++)
    {
        power = power * x;
    }
    printf("Answer is %d \n", power);
```

y = exponent
x = base

* Refer loops.

(c)

a.) What is the general format of for loop, on which occasions you use a 'for loop'?

→
```
for ( expression 1 ; expression 2 ; expression 3 )
{
        // body
}
```

* For is used to represent an iteration or repetition within a program.

b) Write a single printf statetment to display the values of an integer X and float variable Y.

→
```
printf ( " %d  %f " , x , y );
```

OR

```
printf ( " x = %d  y = %f " , x , y );
```

c.) Declare and assign values for four different variables with four different data types.

→
```
int a = 10;
char b = 'c';
float c = 12.5;
double d = 58752.62
```

* use single qoute for single character 'c'

d) What are the assignment operators and when we use them?

→ + =
- =
* =
/ =

Assignment operators are used to write an arithmetic expression is a short form

Ex : x = x + 10 as x + = 10

e.) Explain the general formula (1 mark) and the use (1 mark) of a switch conditional structure.

→
```
switch (<variable>)
{
    case <option 1> : //statement ; break;
    case <option 2> : // statement ; break;
    case <option 3> : // statement ; break;
    default : statement;
}
```

*Study a program using Switch.

(2)

1.) Use adding 2 numbers as an example and write four different functions to explain the behavior and use four different function types.

→ No return type, no parameters

```
#include <stdio.h>
void sum()
{
    int x, y, sum;
    printf("Enter two numbers : ");
    scanf("%d %d", &x, &y);
    Sum = x + y;
    printf("The sum is %d", sum);
}
int main()
{
    sum();
}
```

→ No return type, with parameters

```
#include <stdio.h>
void sum(int a, int b);
{
    int z;
    z = a + b;
    printf("The Sum is %d", z);
}
int main()
{
    int x, y;
    print f("Enter two numbers : ");
    scanf("%d %d", &x, &y);
    sum(x, y);
}
```

* value of x goes to a

* value of y goes to b

return z;

→ With return type, no parameters

```
#include <stdio.h>
int sum()
{
        int x, y, z;
        printf("Enter two numbers");
        scanf("%d %d", &x, &y);
        z = x+y;
return z;
}

int main()
{
      int c = sum();
      printf("The sum is %d", c);
}
```

→ With return type, with parameters.

```
#include <stdio.h>
int sum(int x, int y)
{
        int z;
        z = x+y;
return z;
}
int main()
{
        int a, b, c;
        printf("Enter two numbers");
        scanf("%d %d", &a, &b);
        c = sum(a, b);
        printf("The sum is %d \n", c);
}
```

B) Create a function to provide three integers as parameters to a function and find and return the highest number. Input 3 numbers in the main function, call the function and display the highest number.

```
int findmax ( int a, int b, int c)
{
    int max;
    if (a > b)
    max = a
    else if ( b > c)
    max = b..
    else max = c
return max;
}
int main ()
{
    int x, y, z;
    printf (" Enter three numbers: ");
    scanf ("%d %d %d",&x &y &z);
    int ans = findmax (x, y, z);
    printf (" The highest is %d \n", ans);
```

(3.)

(A) I.) Input 10 float values and store them in an array

```
int main() {
float arr[10];
int i;
for(i=0; i< 10; i++)
{
    printf("Enter a value in the element %d", i+1);
    scanf("%f", arr[i]);
}
}
```

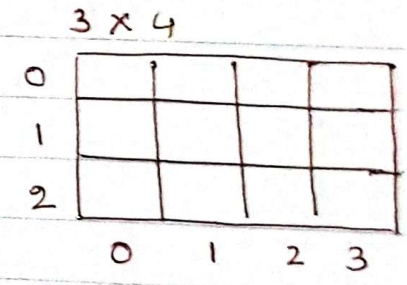
II.) Display the values of the above array.

```
int main()
{
  float arr[10];
  int i;
  for(i=0; i<10; i++)
  {
     printf("Enter a value in the element %d", i+1);
     scanf("%f", arr[i]);
  }
for(i=0; i<10; i++)
{
   printf("%.2f", arr[i]);
}
}
```

III) Find and display the minimum value.

→
```
float = arr [0];
for (i = 1; i < 10; i++)
{
    if (arr [i] < min)
    min = arr [i];
}
printf (" The lowest is %.2f ", min);
```

(B) ~~Dar~~ Declare a multi - dimensional array with the size of 3 x 4. Input values to the array and display the average value




```
for (r = 0; r < 3; r++)
{
    for (c = 0; c < 4; c++)
    {
        printf ("Enter a value ");
        scanf (" %d, & v[r][c]);
        sum = sum + v [r] [c];
    }
}
```

* row by row.

```
avg = (float) sum / 12;
Printf (" The Average is %.2f \n ", avg);
```