CECS 282 **EXAMINATION #1 PRACTICE**

1. Determine the result of the integer variable x for each of the following expressions:

a. [2 points] x = 13/2.0 + 5.6;
6.5+5.6= 12.1
x=12

b. [2 points] x = 13/2 + 5.6;
6+5.6=11.6
x = 11

2. What header file must be included in the following program? What is the output of the program?

```
int main()
{ double x = 13.67;
  cout<<showpoint<<fixed;
  cout<<setw(10)<<x<<endl;
  cout<<x;
  return 0;
}
```

#include <iostream>
#include<iomanip>
using namespace std;

_13.670000
13.670000

3. Assume that x, z, a, b, c, and e are integer variables. Write C++ expressions for the following algebraic expressions:

a. $z = x^{25}$

z = pow(x,20);

4. How do you rewrite the statement to calculate num3 below so it will no longer perform the integer division. NOTE: You are not allowed to change the data type of variables num1, num2 and num3, nor add any new C++ statement in your solution.

```
int num1 = 3, num2= 2;
float num3;
num3 = num1/num2;
```

num3 = static_cast<double>(num1) / num2;

5. Write a cout statement so the variable num is displayed in a field of 10 spaces, in fixed point notation, with a precision of 3 decimal places. The decimal point should always be displayed.

cout << setw(10)<<fixed<<showpoint<<setprecision(3)<< num;

6. Write a cout statement to display the following output:

It's Monday

cout<<"It\'s Monday";

7. What will the following code fragment display?

```
int x = 5, z =10,y=2;
y *= x + 5;// y = y * ( x + 5) = 2 * ( 5 + 5) = 2*10 = 20
cout<<y<<endl; //20
y = x++ + 20; //y = x + 20 = 5 + 20 = 25; x = x + 1= 5+1 =6
x = x + 10; //x = 6 + 10 = 16
cout<<x<<endl; //16
cout<<y<<endl; //25
y = --z + 10; // z = z-1 = 10-1 = 9; y = z + 10 = 9 +10=19
cout<<y<<endl; //19
cout<<z<<endl;//9
```

20
16
25
19
9

8. Using the flowing chart, write an C++ if/else if structure that assigns bonus based on an employee's annual salary. The code must be efficient to get a full credit.

Performance Rating	Bonus
Up to $12,000.00	2%
$12,000.00 to $43,000.00	5%
Over $43,000.00	8%

```
if (salary < 12000.00)
        bonus = .2;
else if (salary <=43000.00)
        bonus = .50;
```

else
bonus = 0.8;

9. [3 points] Write an if statement that print the message "The input is valid" if the variable num is within the range 5 through 21.

```
if (num >= 5 && num <= 21)
        cout << "The input is valid.";
```

10. Write an if statement that print the message "The input is not valid" if the variable num is outside the range 5 through 21

```
if (num < 5 || num > 21)
        cout << "The number is not valid.";
```

10. [5 points] Convert the following switch structure to if/else if structure:

```
switch (rate)
      {
            case 2:
                  cout<< "two";
                  break;
            case 8:
            case 9:
                  cout<<" eight or nine";
                  break;
            case 12:
                  cout<<"twelve";
                  break;
            default:
                  cout<<"None";
      }
```

```
if ( rate = = 2)
  cout<< "two";
else if ( rate = = 8 || rate = = 9)
  cout<<" eight or nine";
```

11. Write C++ statements that ask the users to enter 45 positive integer numbers, and display the number and the running total of the input numbers that are divisible by 3. Your program should not accept any negative input number. If a user enter a negative number, the program should ask the user to input another number until a positive number is entered.

```
#include <iostream>
#include <iomanip>
using namespace std;
int main()
{
int total = 0, count = 0, num, three=0;
while(count<45)
{
cout << "Enter an integer number: ";
cin >> num;
while (num<0)
{cout << "Enter an integer number: ";
cin >> num;
}
if (num % 3 == 0)
 { total += num;
   three += 1;
 }
  count++;
}
cout<<three<<endl;
cout<<total<<endl;
   return 0;
}
```

```
#include <iostream>
#include <iomanip>
using namespace std;
int main()
{
int total = 0, count = 0, num;
while(count<45)
{
cout << "Enter an integer number: ";
cin >> num;
while (num<0)
{cout << "Enter an integer number: ";
cin >> num;
}//end while
cout<<num<<endl;
if (num % 3 == 0)
    total += num;
  count++;
}//end while
cout<<total<<endl;
   return 0;
}
```

12. Write a complete C++ program that prompts the user for two integer numbers. The program assigns the first input number to a variable **a** and the second number to a variable b, calculates a^b, and display the result of a^b. You are not allowed to use the C++ function pow. The program must also provide the following output format:

```
Enter a and b: 4  2
4^2=16
```

```
#include <iostream>
#include <iomanip>
using namespace std;
int main()
{
int a;
int b;
int product = 1;
```

```
int i=1;
cout<<"Enter  a and b; ";
cin>>a>>b;
while  ( i <=b)
{product  = product * a;
 i = i + 1;
}
cout<<a<<"^"<<b<<"="<<product;

  return 0;
}
```

13.A distribution company uses a two-dimensional array to keep track sales.

	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
EAST REGION	10	30	15	40
WEST REGION	32	45	100	37
SOUTH REGION	29	56	41	33
NORTH REGION	46	38	52	34

a. Declare and initialize a two-dimensional array of type float to store the sales.

Answer

```
float sales[4][4] ={{10,30,15,40},{32,45,100,37},{29,56,41,33},{46,38,52,34}} ;
```

b.Write an efficient code fragment that computes the yearly sales for South Region

Answer

```
float sum = 0.0;
for (int q=0; q < 4; q++)
  sum +=  sales[2][q];  // index row 2 means South Region
```

c. Write an efficient code fragment that stores the yearly sales for each region in the same one-dimensional array.

Answer

```
float regionSales[4];
for(int  r=0; r < 4; i++) // r - region
    for(int  q = 0; q < 4; q++) // q - quarter
         regionSales[r]  +=  sales[r][q];
```

d. Write an efficient code fragment that stores the region sales for each quarter in the same one-dimensional array.

Answer

```
float quarterSales[4];
for(int q=0; q < 4; q++) // q – quarter sales
    for(int r = 0; r < 4; r++) // r- region
        quarterSales[q] += sales[r][q];
```

14. A function called convertStoA accepts an argument of string data type. The function converts any character **S** in the string being passed to the function to a character **A.** Implement (define) the function convertStoA. [6 points]

Answer:

```
void convertStoA(char s[])
{ int i =0;
while(s[i] != '\0')
{ if(s[i] == 'S')
s[i]='A';
i++;
}
}
```

Write a main function to test the function convertStoA.

Answer:

```
#include<iostream>
#include<string>
#include<cstdlib>
using namespace std;
void main()
{ char str[80]="SOS abScd";
convertStoA(str);
cout<<str<<endl;
}
```