**WEEK#5-6 …..Short Answer Questions - What is TRUTH?**

1. TRUE or FALSE: Both of the following if statements perform the same operation.

if (sales > 10000)   
 commissionRate = 0.15;

if (sales > 10000) commissionRate = 0.15;

1. TRUE or FALSE: Both of the following if statements perform the same operation.

if (calls == 20)  
 rate \*= 0.5;

if (calls = 20)  
rate \*= 0.5;

1. Although the following code segments are syntactically correct, each contains an error. Locate the error.  
   a) if (hours > 40);  
    cout <<hours <<” hours qualifies for overtime. \n”;  
   b) balance = 1000;  
    if (interestRate =.07)  
    cout <<”This account is earning the maximum rate. \n”;  
   c) if (interestRate >.07)  
    cout <<”This account earns a $10 bonus. \n”;  
    balance += 10.0;
2. Write an if statement that assigns 0 to x if y is equal to 20.
3. Write an if statement that multiplies payRate by 1.5 if hours is greater than 40.
4. Write an if statement that assigns .20 to commission if sales is greater than or equal to 10000.00
5. Write an if statement that set the variable fees to 50 if the flag variable max is set to true
6. Write nested if statements that perform the following test: If amount1 is greater than 10 and amount2 is less than 100, display the greater of the two.
7. Write an if statement that prints the message “The number is valid” if the variable speed is within the range 0 through 200.
8. Write an if statement that prints the message “The number is valid” if the variable speed is outside the range 0 through 200.

**WEEK#5-6 …..Programming Challenges – Using various types of selection control structures**

**Program MATH\_SCORES:** Your math instructor gives three tests worth 50 points each. You can drop one of the test

scores. The final grade is the sum of the two best test scores. Assuming the three test scores are input from the keyboard, write an interactive program that asks the user to enter three test scores and then calculates the final letter grade using the following cut-off points.    
**>=90              A   
<90, >=80     B  
<80, >=70     C  
<70, >=60     D  
< 60                F**

*Input validation: Display an error message if the user enters a score greater than 50 and do not accept negative values.*

**Program Math Calculator:**Write a program that displays the following menu:  
  
**Simple Math Calculator  
  
1. Calculate the Area of a Circle  
2. Calculate the Perimeter of a Rectangle  
3. Calculate the Area of a Triangle  
4. Quit  
  
Enter your choice (1 - 4):**

If the user enters 1, the program should ask for the radius of the circle and then display its area.   
Use the following formula: **area = π*r*2**\*Use 3.14159 for π and the radius of the circle for *r.*If the user enters 2, the program should ask for the length and width of the rectangle and then display the rectangle's perimeter. Use the following formula: **perimeter = 2(length + width)**

If the user enters 3 the program should ask for the length of the triangle's base and its height, and then display its area. Use the following formula: **area = base \* height \* .5**  
  
If the user enters 4, the program should end.  
  
*Input validation: Display an error message if the user enters a number outside the range 1 through 4 when selecting an item from the menu.   
Do not accept negative values for the circle's radius, the rectangle's length or width, or the triangle's base or height.*

**Software Sales**

A software company sells a package that retails for $99. Quantity discounts are given according to the following table.

Quantity Discount  
10—19 20%  
20—49 30%  
50—99 40%  
l00 or more 50%

Write a program that asks for the number of units purchased and computes the total cost of the purchase.

*Input Validation: Make sure the number of units is greater than 0.*