Operator Related Problems

(Total 15 questions)

<table>
<tr><th>SL</th><th>Problem statement</th><th>Difficulty levels</th></tr>
<tr><td>1.</td><td>Program that will take two numbers X and Y as inputs, then calculate and print the values of their addition, subtraction, multiplication, division (quotient and reminder).

-14 % 3 = -2

-14 % -3 = -2

<table><tr><th>Sample input (X,Y)</th><th>Sample output</th></tr><tr><td>5 10</td><td>Addition: 15
Subtraction: -5
Multiplication: 50
Quotient : 0
Reminder: 5</td></tr><tr><td>-5 10.5</td><td>Addition: 5.5
Subtraction: -15.5
Multiplication: -52.5
Quotient: 0
Reminder: -5</td></tr></table></td><td>*</td></tr>
<tr><td>2.</td><td>Program that will calculate the circumference of a circle having radius r.</td><td>*</td></tr>
</table>

Area, A = 2 * Pi * r

Sample input (r)	Sample output
5	Area: 31.4
10.5	Area: 65.94

3. Program that will take two numbers **(a, b)** as inputs and compute the value of the equation – (Without using math.h) *

$$X = (3.31 * a^2 + 2.01 * b^3) / (7.16 * b^2 + 2.01 * a^3)$$

Sample input (a, b)	Sample output
5 10.5	X = 2.315475
100 -250	X = -12.766287

4. Program that will increment and decrement a number **X** by 1 inside the *printf* function. (Use ++ and - - operators) **

Sample input(X)	Sample output
5	X++ : 5 ++X : 6 X- - : 5 --X : 4

	-5	X++ : -5 ++X : -4 X- - : -5 --X : -6	
5.	Program that will increment and decrement a number **X** by **Y**. (Use += and -= operators) **Sample input(X,Y)** / **Sample output** 5 10 / Incremented Value: 15 Decremented Value: -5 -5 5 / Incremented Value: 0 Decremented Value: -10		*
6.	Program that will multiply and divide a number **X** by **Y**. (Use *= and /= operators) **Sample input(X,Y)** / **Sample output** 56 10 / Multiplication: 560 Division: 5 -56 -10 / Multiplication: 560 Division: 5		*
7.	Program that will declare and initialize an integer and a floating point number. Then it will		**

perform floating to integer and integer to floating conversions using

(a) Assignment operation

(b) Type casting

Sample input	**Sample output**
-150 123.125	Assignment: 123.125000 assigned to an int produces 123 Assignment: -150 assigned to a float produces -150.000000 Type Casting: (float) -150 produces -150.000000 Type Casting: (int) 123.125 produces -123

8. Program that will take two numbers as inputs and print the maximum value. (Using conditional operator - ?) **

Sample input (x, y)	**Sample output**
20 100	Max: 100
50 -20	Max: 50

9. Program that will evaluate the following equations - *

$$X = a - b / 3 + c * 2 - 1$$

$$Y = a - (b / (3 + c) * 2) - 1$$

$$Z = a - ((b / 3) + c * 2) - 1$$

	<table><tr><th>Sample input (a, b, c)</th><th>Sample output</th></tr><tr><td>9 12 3</td><td>X = 10 Y = 4 Z = -2</td></tr></table>	
10.	Program that will take **a**, **b** & **c** as inputs and decide if the statements are True (1) of False (0) a) $(a+b)\leq 80$ b) $!(a+c)$ c) $a!=0$ <table><tr><th>Sample input (a, b, c)</th><th>Sample output</th></tr><tr><td>10 -10 0</td><td>a) 1 b) 0 c) 1</td></tr></table>	**
11.	Program that will take **a**, **b** & **c** as inputs and decide if the statements are True (1) of False (0) 1) $(a+b)\leq 80 \;\&\&\; b\geq 0$ 2) $(a-b)==0 \;||c!=0$ 3) $a!=b \;||(b<a)\&\&c>0$	***

	<table><tr><th>Sample input (a, b, c)</th><th>Sample output</th></tr><tr><td>10 -10 0</td><td>1) 0 2) 1 3) 1</td></tr></table>	
12.	Program that will take calculate the roots of a quadratic equation ($a.x^2 + b.x + c = 0$) from the formula, (here, dot (.) stands for multiplication) - $root = \frac{-\ b\ \pm\ \sqrt{(\ b^2 - 4.\ a.c)}}{2.\ a}$ <table><tr><th>Sample input (a, b, c)</th><th>Sample output</th></tr><tr><td>2 4 -16</td><td>2.00 -4.00</td></tr><tr><td>1 2 3</td><td>Imaginary</td></tr></table>	***
13.	Program that will evaluate the equation $2\ cos^2\ x - \sqrt{3}\ sinx + \sin\frac{x}{2}$; where 1<= x <=180 [No checking needed] <table><tr><th>Sample input (x)</th><th>Sample output</th></tr></table>	***

	30	0.8927936413
	120	-0.1339745962
	180	3.000013
14.	Program that will take a floating point number **X** as input and evaluate **A,B,C** where- **A** = Value when **X** is rounded up to the nearest integer **B** = Value when **X** is rounded down to the nearest integer **C** = Absolute value of **X**	**
	Sample input(X)	**Sample output**
	10.6	A = 11, B = 10, C = 10.6
	-77.9	A = 78, B = 77, C = 77.9
15.	Program to find size of int, float, double and char of the system.	**
	Sample input	**Sample output**
		Size of int in byte(s) = 4 Size of float in byte(s) = 4 Size of double in byte(s) = 8 Size of char in byte(s) = 1