Condition 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 decide whether a number is positive or not.

<table><tr><th>Sample input</th><th>Sample output</th></tr><tr><td>100</td><td>Positive</td></tr><tr><td>-11.11</td><td>Negative</td></tr><tr><td>0</td><td>Positive</td></tr></table></td><td>*</td></tr>
<tr><td>2.</td><td>Program that will decide whether a number is even or odd.

<table><tr><th>Sample input</th><th>Sample output</th></tr><tr><td>50</td><td>Even</td></tr><tr><td>-77</td><td>Odd</td></tr><tr><td>0</td><td>Even</td></tr></table></td><td>*</td></tr>
<tr><td>3.</td><td>Program that will take an integer of length one from the terminal and then display the digit in English.

<table><tr><th>Sample input</th><th>Sample output</th></tr><tr><td>9</td><td>nine</td></tr><tr><td>0</td><td>zero</td></tr></table></td><td>*</td></tr>
<tr><td>4.</td><td>Program that will check whether a triangle is valid or not, when the three angles (angle value should be such that, 0 < value < 180) of the triangle are entered through the keyboard.
[Hint: A triangle is valid if the sum of all the three angles is equal to 180 degrees.]

<table><tr><th>Sample input</th><th>Sample output</th></tr><tr><td>90 45 45</td><td>Yes</td></tr><tr><td>30 110 40</td><td>Yes</td></tr><tr><td>160 20 30</td><td>No</td></tr><tr><td>0 180 0</td><td>No</td></tr></table></td><td>*</td></tr>
</table>

5. Program that will read from the console a random positive nonzero number and determine if it is a power of 2. **

Sample input	**Sample output**
1	Yes
512	Yes
1022	No

6. Program that will read from the console a random number and check if it is a nonzero positive number. If the check is yes, it will determine if the number is a power of 2. ***

If the check fails the program will check for two more cases. If the number is zero, the program will print “Zero is not a valid input”. Else it will print “Negative input is not valid”.

Sample input	**Sample output**
0	Zero is not a valid input
1	Yes
512	Yes
1022	No
-512	Negative input is not valid

7. Program that will take two numbers **X** & **Y** as inputs and decide whether **X** is greater than/less than/equal to **Y.** *

Sample input (X,Y)	**Sample output**
5 -10	5 is greater than -10
5 10	5 is less than 10
5 5	5 is equal to 5

8. Program that will decide whether a year is leap year or not. *

Yes, if (Year % 4 == 0 && year % 100 != 0) || (Year % 400 ==0)

Sample input	**Sample output**
2000	Yes
2004	Yes
2014	No

9. Program that will categorize a single character that is entered at the terminal, whether it is an alphabet, a digit or a special character. *

(**Restriction:** Without math.h)

Sample input	**Sample output**
z	Alphabet
A	Alphabet
8	Digit
*	Special

10. Program that will evaluate simple expressions of the form- **

<number1> <operator> <number2>

; where operators are (+, - , *, /)

And if the operator is "/", then check if <number2> nonzero or not.

Sample input	**Sample output**
100 * 55.5	Multiplication: 5550
100 / -5.5	Division: -18.181818
100 / 0	Division: Zero as divisor is not valid!

11. Program that will take the final score of a student in a particular subject as input and find his/her grade. *

Marks	Letter Grade	Marks	Letter Grade	Marks	Letter Grade
90-100	A	70-73	C+	Less than 55	F
86-89	A-	66-69	C		
82-85	B+	62-65	C-		
78-81	B	58-61	D+		
74-77	B-	55-57	D		

Sample input	**Sample output**
91.5	Grade: A
50	Grade: F

12. Program that will construct a menu for performing arithmetic operations. The user will give two real numbers **(a, b)** on which the arithmetic operations will be performed and an integer number (1 <= Choice <= 4) as a choice. Choice-1, 2, 3, 4 are for performing addition, subtraction, multiplication, division (quotient) respectively. *

Sample input (a, b, Choice)	**Sample output**
5 10 3	Multiplication: 50
-5 10.5 4	Quotient: 0

13. Program that will construct a menu for performing arithmetic operations. The user will give two real numbers **(a, b)** on which the arithmetic operations will be performed and an integer number (1 <= **Choice** <= 4) as a choice. Choice-1, 2, 3, 4 are for performing addition, subtraction, multiplication, division respectively. **

If Choice-4 is selected, again the program will ask for another choice (1 <= **Case** <=2), where Case-1, 2 evaluate quotient and remainder respectively.

Sample input	**Sample output**
5 10 3	Multiplication: 50
-5 10.5 4 1	Quotient: 0
-5 10.5 4 2	Remainder: -48

1. Addition
2. Subtraction
3. Multiplication
4. Division

    1. Quotient
    2. Remainder

14. Program that will construct a menu for performing arithmetic operations. The user will give two real numbers **(a, b)** on which the arithmetic operations will be performed and an integer number (1 <= **Choice** <= 4) as a choice. Choice-1, 2, 3, 4 are for performing addition, subtraction, multiplication, division respectively. ***

If Choice-4 is selected, the program will check if **b** is nonzero.

If the check is true, the program will ask for another choice (1 <= **Case** <=2), where Case-1, 2 evaluate quotient and reminder respectively. If the check is false, it will print an error message "Error: Divisor is zero" and halt.

Sample input	**Sample output**
5 10 3	Multiplication: 50
-5 10.5 4 2	Reminder: -48
-5 0 4	Error: Divisor is zero

15. Program for "Guessing Game": ***
Player-1 picks a number **X** and Player-2 has to guess that number within **N = 3** tries. For each wrong guess by Player-2, the program prints "Wrong, **N-1** Chance(s) Left!" If Player-2 successfully guesses the number, the program prints "Right, Player-2 wins!" and stops allowing further tries (if any left). Otherwise after the completion of **N = 3** wrong tries, the program prints "Player-1 wins!" and halts.

[**Restriction:** Without using loop/break/continue
Hint: Use flag]

Sample input (X, n1, n2, n3)	***Sample output***
5 12 8 5	Wrong, 2 Chance(s) Left! Wrong, 1 Chance(s) Left! Right, Player-2 wins!
100 50 100	Wrong, 2 Chance(s) Left! Right, Player-2 wins!
20	Wrong, 2 Chance(s) Left!

		12 8 5	Wrong, 1 Chance(s) Left! Wrong, 0 Chance(s) Left! Player-1 wins!	