



Attempt **all** the following questions:

**Question 1:** (2 Marks)

Determine the output for each of the following code snippets (assuming successful compilation):

a) (1 Mark)	b) (1 Mark)
<pre>for (int i = 0; i &lt; 5; i++) {     for (int j = 0; j &lt; 5; j++) {         char c;         switch (abs(i - j)) {             case 0 : c = '\\'; break;             case 2 : c = '+' ; break;             case 4 : c = '.' ; break;             default: c = ' ' ; break;         }         cout &lt;&lt; c;     }cout &lt;&lt; endl;}</pre>	<pre>for (int i = 1; i &lt;= 10; ++i) {     if ( i == 6    i == 9) {         continue;     }     cout&lt;&lt;i&lt;&lt;"\t"; }</pre>

**Question 2:** (4 Marks)

**Tip, Tax, and Total:**

Design a program that calculates the total amount of a meal purchased at a restaurant. The program should ask the user to enter the charge for the food, and then calculate the amount of a 15 percent tip and 7 percent sales tax. Display each of these amounts and the total.

**Question 3:** (4 Marks)

**Software Sales:**

A software company sells a package that retails for \$100. Quantity discounts are given according to:

Quantity	Discount
10–19	20%
20–49	30%
50–99	40%
100 or more	50%

Design a program that asks the user to enter the number of packages purchased. The program should then display the amount of the discount (if any) and the total amount of the purchase after the discount.

**Question 4:** (5 Marks)

**Armstrong Number:**

Write a C++ program which takes a number from the user and check whether it is Armstrong Number or not. Hint: A number in which the sum of cube of its individual digits is equal to the number itself is called Armstrong number. For Example:  $4 * 4 * 4 + 0 * 0 * 0 + 7 * 7 * 7 = 407$  is an Armstrong number.

**Question 5:** (5 Marks)

Design a program that uses nested loops to collect data and calculate the average rainfall over a period of years. The program should first ask for the number of years. The outer loop will iterate once for each year. The inner loop will iterate twelve times, once for each month. Each iteration of the inner loop will ask the user for the inches of rainfall for that month. After all iterations, the program should display the number of months, the total inches of rainfall, and the average rainfall per month for the entire period.

Good Luck  
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