Professor Sally Mander has 25 students in her Data Structures class and 17 students in her Discrete Math class.
Assuming that there are no students who take both classes, how many students does Sally have? _____
A) 50  B) 34  C) 8  D) 42  E) 26
Assuming there are 8 students who take both classes, how many students does Sally have? _____
A) 50  B) 34  C) 8  D) 42  E) 26

Which of the following would require the use of strong induction and which would require the use of weak induction in a proof?  
A) weak induction  B) strong induction

_____ T(n) = T(n-1) + T(n-3)  _____ T(n) = T(n-1) + T(n-2)  _____ T(n) = T(n-1) + 2^n
_____ T(n) = 2*T(n-1)  _____ T(n) = n*T(n-1)  _____ T(n) = T(n-1) + 5

Define a function for P(T) that displays the nodes in Pre-Order for a binary search tree T. B1 and B2 are possible base cases. R1 and R2 are possible recursive cases. Fill in the blanks with the number associated with an appropriate statement. Not all blanks need to be filled. If there is only one base case, only put a number in B1. Likewise for recursive case. In any subtree, r denotes a root node, T1 denotes a left subtree, and T2 denotes a right subtree.

1. If T is the empty tree, P(T) = "" (empty listing).
2. If T is the empty tree, P(T) = "r".
3. If T is the single node r, then P(T) = "r".
4. If T is the single node r, then the P(T) = "" (empty listing).
5. If T has root r and subtrees T1 and T2, then P(T) = "P(T1), r, P(T2)".
6. If T has root r and subtrees T1 and T2, then P(T) = "P(T1), P(T2), r".
7. If T has root r and subtrees T1 and T2, then P(T) = " r, P(T1), P(T2)".
8. If T has root r and subtrees T1 and T2, then P(T) = " r, P(T2), P(T1)".
9. If T has root r and subtrees T1 and T2, then P(T) = "P(T2), r, P(T1)".
10. If T has root r and subtrees T1 and T2, then P(T) = "P(T2), P(T1), r".

Note: Not all blanks need to be filled.

How many 5-digit zip codes contain no even digits? _____
[Assume all decimal digits can be used in any position in the zip code]
A) 5^5  B) 5!  C) (5!/2  D) P(10,5)  E) C(10,5)  F) (5^{10} - 5^5)
What is the value of $P(8,2)$? _____
A) 56  B) 20160  C) 16  D) 28  E) Same as $P(8,6)$

What is the value of $C(8,2)$? _____
A) 56  B) 20160  C) 16  D) 28  E) Same as $C(6,2)$

How many numbers between 1 and 100 (inclusive) are divisible by either 2 or 5? _____
A) 70  B) 80  C) 100  D) 50  E) 60

The school board consists of four men and three women. How many ways are there to select a subcommittee of four board members? _____
A) $P(7,3)$  B) $C(7,4) + C(7,3)$  C) $C(7,4) \times C(7,3)$  D) $C(7,4)$  E) $P(7,4)$

What does the shunting-yard algorithm do? _____
A) Performs Dijkstra's algorithm the most efficiently  B) Eliminates all goto statements in a program
C) Performs game theory analysis to predict a winner  D) Makes grass in computer graphics look real
E) Simulates a fair coin with a (possibly) biased coin  F) Converts infix notation to RPN

How many five letter words can be formed from the word COMPUTER? _____
A) $C(8,5)$  B) $C(8,3)$  C) $P(8,5)$  D) $P(8,3)$  E) $P(8,8)$  F) $8^5$

This quarter UCSD is offering 3 Math courses (Algebra (A), Calculus (C), Discrete (D)) and 4 Computer Science course (Logic (L), Machine Learning (ML), Networks (N), Operating System (OS)). Students are required to take one math and one CS course. Calculus (C) and Machine Learning (ML) are scheduled at the same time. Algebra (A) is a pre-req for Logic (L). Fill in a decision tree to show your possibilities. Use the letters associated with each class in your decision tree. List the Math classes first (higher in your decision tree). Not all slots need to be used.

```
       Math
          /
         /
        /  
       A    B
       /
      /
    C    D
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How many ways can you choose your two courses? _____