How many different strings can be formed by rearranging the letters in the word ABCABCA? _____
A) $C(7,3)$  
B) $P(7,3)$  
C) $7!(3!2!2!)$  
D) $7^3$  
E) $7^3$  
F) $(3!2!2!)/7!$

26 refrigerator magnets (A-Z). No duplicates. How many 5-letter strings can be formed from them? _____
A) $C(26,5)$  
B) $P(26,5)$  
C) $26^5$  
D) $26!$  
E) $5^{26}$  
F) $5!$

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

<table>
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<tr>
<th></th>
<th>[T(n) = T(n-1) + T(n-3)]</th>
<th>[T(n) = T(n-1) + T(n-2)]</th>
<th>[T(n) = T(n-1) + 2^n]</th>
<th>[T(n) = 2*T(n-1)]</th>
<th>[T(n) = n*T(n-1)]</th>
<th>[T(n) = T(n-1) + 5]</th>
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Define a function for $P(T)$ that displays the nodes in Post-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(s). In any subtree, $r$ denotes a root node, $T_1$ denotes a left subtree, and $T_2$ denotes a right subtree.

1. If $T$ is the empty tree, $P(T) = "\text{"}$(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 $P(T) = "\text{"}$(empty listing).
5. If $T$ has root $r$ and subtrees $T_1$ and $T_2$, then $P(T) = "P(T_1), r, P(T_2)"$.
6. If $T$ has root $r$ and subtrees $T_1$ and $T_2$, then $P(T) = "P(T_1), P(T_2), r"$.
7. If $T$ has root $r$ and subtrees $T_1$ and $T_2$, then $P(T) = "r, P(T_1), P(T_2)"$.
8. If $T$ has root $r$ and subtrees $T_1$ and $T_2$, then $P(T) = "r, P(T_2), P(T_1)"$.
9. If $T$ has root $r$ and subtrees $T_1$ and $T_2$, then $P(T) = "P(T_2), r, P(T_1)"$.
10. If $T$ has root $r$ and subtrees $T_1$ and $T_2$, then $P(T) = "P(T_2), P(T_1), r"$.


Note: Not all blanks need to be filled.

How many 5-digit zip codes have all different 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 $P(8,2)$ the same as? _____
A) $C(8,2)*2!$  
B) $C(8,2)/2!$  
C) $C(8,6)$  
D) $8!/2!$  
E) $P(8,6)$
What is the value of \( C(8, 2) \) the same as? 

A) \( P(2, 8) \)  
B) \( C(2, 8) \)  
C) \( C(8, 6) \)  
D) \( P(8, 6) \)  
E) \( C(6, 2) \)

If 17 students are enrolled CSE 11 and 20 students are enrolled in CSE 21, how many different students are enrolled in these two classes …

if there are 5 students enrolled in both?  

A) 37  
B) 3  
C) 32  
D) \( C(37, 5) \)  
E) 27

if there are no students enrolled in both?  

A) 37  
B) 3  
C) 32  
D) \( C(37, 5) \)  
E) 27

An urn contains 10 balls numbered 1-10. Four balls are drawn from the urn in sequence, and the numbers on the balls are recorded. How many ways are there to do this …

if the balls are replaced before the next one is drawn?  

A) \( P(10, 4) \)  
B) \( C(10, 4) \)  
C) 4!  
D) 4\(^10\)  
E) 10\(^4\)  
F) 10! – 6!

if the balls are drawn and not replaced?  

A) \( P(10, 4) \)  
B) \( C(10, 4) \)  
C) 4!  
D) 4\(^10\)  
E) 10\(^4\)  
F) 10! – 6!

Who is credited for inventing the merge sort?  

A) Edsger Dijkstra  
B) Alan Turing  
C) John von Neumann  
D) Michael Merge  
E) Donald Knuth  
F) No one person; designed by a committee

How many three 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) \( 8^3 \)

How many four-digit binary strings are there that do not contain 000 or 111? First draw a decision tree.

How many such four-digit binary strings that do not contain 000 or 111? ____