COT 3100 Quiz #2 (Version A): Counting (7/8/2026)

Last Name: _____ First Name: _____

Circle Recitation: 3:00 pm (Lab 15) 4:00 pm (Lab 16)

1) (5 pts) **There are 10 girls and 7 boys in a class.** Answer the following counting questions about the class. Please give an integer answer for questions a, b and c. You may leave your answer for questions d and e in powers, factorials and combinations.

a) (1 pt) One student must be chosen as class president. In how many ways can the president be chosen?

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b) (1 pt) One boy and one girl must be chosen to represent the class at the school wide mixed-doubles ping-pong tournament. How many possible different teams could represent the class?

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c) (1 pt) The teacher creates teams of 2 with one girl and one boy, but these leaves some girls left out, who are all placed on their own team. How many girls are on this team?

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d) (1 pt) The teacher must line up the class. In how many different orders can she line up the students in the class?

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e) (1 pt) A teacher asks each student whether or not they like pizza. Each student answers either "YES" or "NO". The chalkboard shows that exactly 10 students said yes. How many possible subsets of students could have said "YES", based on this information?

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2) (5 pts) At the time of this quiz, exactly 8 teams remain vying for the World Cup. There will be four quarterfinal matches, two semifinal matches and one final match. (The 4 winning teams in the quarterfinals play in the semifinals and then the two winning teams in the semifinals play in the finals.) There are a possible 128 possible outcomes amongst all of the matches. How many of these possible outcomes involve France facing Norway in the final match? **Note: France and Norway are on opposite sides of the draw, so they CAN NOT face each other until the final match, if at all.** Please express your answer as a single integer.

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For the rest of the problems, please leave your answers in powers, factorials and combinations.

3) (10 pts)

(a) (2 pts) How many permutations of the letters in LIONKING are there?

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(b) (4 pts) How many permutations of the letters in LIONKING start AND end with a vowel?

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(c) (4 pts) How many permutations of the letters in LIONKING do NOT have two consecutive vowels?

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4) (5 pts) Jenna has chosen a passcode. Her passcode is a sequence of integers, where each integer is in between 1 and 100, with no repeats. It just so happens that Jenna's passcode contains 4 integers and is in increasing order. Stella is trying to break Jenna's passcode by trying each possibility based on this information. In the worst case, how many sequences must Stella try to find Jenna's passcode?

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