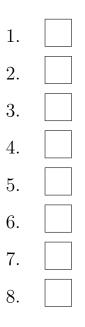
MAT 258 Quiz 2 Answer Sheet

May 22, 2023

Quiz ID: QDC

Name: _____



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MAT 258 Quiz 2

1. How many bit strings of length 7 contain both of the substrings 0110 and 1001 ?

- a) 6 b) 8 c) 10 d) 16 e) 12
- 2. A task consists of lining up 6 people from left to right and then placing a penny, a nickel, a dime, and a quarter into the left or right pocket of 4 of these 6 people. In the end there will be exactly one coin in exactly one pocket of exactly 4 of the 6 people, who are standing in order from left to right. In how many different ways can this task be performed?
 - a) $(6!2^4)^2$ b) $(6!4!)^2$ c) $(6!)^2 4!$ d) $(6!)^2 2^4$ e) $(6!)^2 2^3$
- 3. How many strings of length 7 are there, whose characters are chosen from the digits 0,1, and 2, if each digit occurs at least twice?

a) 520 b) 500 c) 630 d) 720 e) 600

- 4. How many different functions are there from $X = \{1, 2, 3, 4\}$ to $Y = \{5, 6, 7\}$? a) 85 b) 81 c) 80 d) 89 e) 84
- 5. How many different surjective (onto) functions are there from $X = \{1, 2, 3, 4\}$ to $Y = \{5, 6, 7\}$? a) 36 b) 45 c) 80 d) 30 e) 56
- 6. How many solutions does the equation $x_1 + x_2 + x_3 + x_4 + x_5 = 7$ have with integers $x_i \ge 0$? a) 424 b) 500 c) 104 d) 384 e) 330
- 7. How many solutions does the equation $x_1 + x_2 + x_3 + x_4 + x_5 = 7$ have with integers $x_i \ge 0$ and assuming that each $x_i \le 2$? (Hint: first think of how many x_i must equal 2.) a) 84 b) 64 c) 24 d) 30 e) 40
- 8. What is the cardinality of $A \cup B \cup C$ if A and B are disjoint, $|A \cap C| = 4$, $|B \cap C| = 6$, and |A| = |B| = |C| = 10? a) 24 b) 28 c) 18 d) 20 e) 30