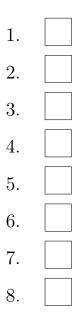
MAT 258 Quiz 2 Answer Sheet

May 22, 2023

Quiz ID: MVX

Name: _____



Submit electronic answers at http://azrael.digipen.edu/cgi-bin/MAT258quiz.pl Test ID: MVX

Name: _____

May 22, 2023

MAT 258 Quiz 2

1. How many bit strings of length 7 contain both of the substrings 0110 and 1001 ?a) 12b) 10c) 16d) 8e) 6

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) $(6!)^2 2^3$ b) $(6!)^2 4!$ c) $(6!)^2 2^4$ d) $(6!4!)^2$ e) $(6!2^4)^2$

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

- 4. How many different functions are there from $X = \{1, 2, 3, 4\}$ to $Y = \{5, 6, 7\}$? a) 84 b) 80 c) 89 d) 81 e) 85
- 5. How many different surjective (onto) functions are there from $X = \{1, 2, 3, 4\}$ to $Y = \{5, 6, 7\}$? a) 56 b) 80 c) 30 d) 45 e) 36
- 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) 330 b) 104 c) 384 d) 500 e) 424
- 7. How many solutions does the equation x₁ + x₂ + x₃ + x₄ + x₅ = 7 have with integers x_i ≥ 0 and assuming that each x_i ≤ 2? (Hint: first think of how many x_i must equal 2.)
 a) 40 b) 24 c) 30 d) 64 e) 84
- 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) 30 b) 18 c) 20 d) 28 e) 24