Math 3201 Unit 2 SAMPLE Test

Name:_____

Multiple Choice. Place the letter of the correct response in the space provided at the right. Please use CAPITAL letters. (10 marks)

Note: ${}_nP_r = \frac{n!}{(n-r)!}$ $P = \frac{n!}{a!b!c!...}$ ${}_nC_r = \frac{n!}{r!(n-r)!}$

1. Zack is trying to select a new cell phone based on the following categories:

Brands: Samsung, Apple, Nikon

Color: Lime, Magenta, Navy, Orange, Black

Plans: Unlimited Texting, Unlimited Calling

How many different options can Zack choose from? 1. ____

A) 6 B) 10 C) 30 D) 120

2. In how many ways can 7 children line up for recess? 2.____

A) 1 B) 7 C) 28 D) 5040

3. Evaluate: $\frac{4!\cdot 7!}{8!}$ 3.____

A) 0 B) 1 C) 3 D) $\frac{1}{3}$

4. Simplify: $\frac{(n-2)!}{n!}$ 4.____

A) $\frac{1}{n^2-n}$ B) $\frac{1}{n^2-3n+2}$

C) n^2-n D) n^2-3n+2

5. A license plate consists of 3 letters, followed by 3 numbers. Repetitions are not allowed. If any letter may be used except for U and I, and the allowed digits are 3, 4, 5, 6, 7, 8, and 9, how many different license plates can be produced? 5.____

A) 500 405 B) 900 800 C) 1 059 776 D) 2 550 240

6. A parking lot in front of a coffee shop has six parking spaces. How many ways can 5 cars park in the spaces? 6.____

A) 6 B) 56 C) 120 D) 720

7. There are 7 marbles in a bowl: 2 white, 3 green and 2 blue. If taken out one at a time, in how many different ways can all 7 marbles be taken out of the bowl? 7.____

A) 105 B) 210 C) 420 D) 5040

8. A math class has 12 boys and 15 girls. A group of six students is randomly selected to participate in a competition. If the group of 6 students must consist of exactly 2 boys and 4 girls, how many different groups can be formed? 8.____

A) 1421 B) 45821 C) 90090 D) 4324320

9. Evaluate: $\binom{9}{4}$ 9.____

A) 118 B) 122 C) 126 D) 130

10. How many different arrangements can be made using all the letters in **CALGARY** if the first letter must be **G** ? 10.____

A) 120 B) 360 C) 480 D) 720

Constructed Response. Show all workings to receive full credit. (15 marks)

1. Ryder is going to purchase a new vehicle. He can choose from a truck, car or suv; with manual or automatic transmission; in red, black or white. Draw a **tree diagram** and use it to determine **how many choices** he has for his new vehicle. (2)

2. Find the number of permutations of the word **WINTER** if:

a) there are no restrictions? (1)

b) the vowels must be kept together? (2)

3. How many ways can 5 cash prizes be awarded in a lottery that sold 100 tickets if each ticket

a) is **not** replaced? (1)

b) **is** replaced? (1)

4. Algebraically solve for 'n': $\frac{(n+1)!n!}{(n-1)!} = 20$ (4)

5. There are 7 boys and 10 girls in a school travel club. A group of 5 is needed to set up an exhibit. How many different groups of 5 students with at least 3 girls are there to choose from? (4)