Q1
5 Points

Suppose a pirate stumbles into a shop that sells: eye patches, wooden legs, hook hands, and parrots. Because the pirate is missing a leg, he only has time to snatch 7 items. How many ways are there for him to steal 7 items if there are at least 7 of each type of item. (e.g he could steal 7 eye patches).

Submit as an integer value with NO LaTeX or extra formatting/characters (NO COMMAS OR SPACES!!!)

120

Q2
5 Points

Determine the number of arrangements of the letters in GEORGIATECH such that all the E's are consecutive.

Submit as an integer value with NO LaTeX or extra formatting/characters (NO COMMAS OR SPACES!!!)

1814400

Q3
5 Points

This question requires a picture submission. See instructions on title page.

If you have to put $n+1$ pigeons into n holes, then you would have to put at least two pigeons into the same hole. What is the result if you place $3m^2n+c$ pigeons into n holes, where m, n and c are all positive integers and $1 \leq c \leq n$?

▾ **Screen Shot 2023-04-17 at 1.14.35 PM.png**

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Pigeons: $3m^2n + c$
Holes: n
Minimum number of pigeons per hole: $ceiling(\frac{3m^2n+c}{n}) = 3m^2 + ceiling(\frac{c}{n}) = 3m^2 + 1$

Q4
5 Points

How many ways are there to seat 9 people around a circular table, where two seatings are considered the same when each person has the same left neighbor and right neighbor?

Submit as an integer value with NO LaTeX or extra formatting/characters (NO COMMAS OR SPACES!!!)

40320

Q5
5 Points

Erik and Bjorn are two Vikings on a boat of 17 Vikings. Assuming all Vikings volunteer, how many ways are there to form a group of 5 so that either Erik or Bjorn is in the group but they are not both in the group?

Submit as an integer value with NO LaTeX or extra formatting/characters (NO COMMAS OR SPACES!!!)

2730

Q6
10 Points

How many positive integers with 5 or less digits are even or divisible by 5 and do not contain any repeated digits? Leading 0's are also not allowed.

Submit as an integer value with NO LaTeX or extra formatting/characters (NO COMMAS OR SPACES!!!)

19655

Q7
10 Points

Steve wants to buy up to 20 bottles of orange juice. If there are 8 different brands he can choose from, how many ways can he buy the bottles?

Submit as an integer value with NO LaTeX or extra formatting/characters (NO COMMAS OR SPACES!!!)

3108105

Q8
20 Points

Imagine you are drawing from a deck of 52 cards (The 52 standard cards). Determine the number of ways you can achieve the following 5-card hands drawn from the deck without repeats.

Submit as an integer value with NO LaTeX or extra formatting/characters (NO COMMAS OR SPACES!!!)

Q8.1
5 Points

A Straight (5 cards of sequential rank; may be a Straight Flush as described in part D). Hint: when considering the Ace, a straight could be Ace, 2, 3, 4, 5 or 10, Jack, Queen, King, Ace, but no other wrap-around is allowed (e.g., Queen, King, Ace, 2, 3 is not allowed)

10240

Q8.2
5 Points

A Flush (5 cards of the same suit; may be a Straight Flush as described in part D)

5148

Q8.3
5 Points

A Full House (3 cards of one rank and 2 from a single other rank)

3744

Q8.4
5 Points

A Straight Flush (5 cards of sequential rank from the same suit)

40

Q9
10 Points

Determine the number of non-negative integer solutions of $x_1 + x_2 + x_3 + x_4 + x_5 < 18$ such that $x_i \geq 2$ for each i, and $x_4 \geq 7$.

Submit as an integer value with NO LaTeX or extra formatting/characters (NO COMMAS OR SPACES!!!)

21

Q10
7 Points

Determine the number of strings made from the digits 0-9 of length 10 where every number appears exactly once, and no multiples of 3 can be beside one another. (Reminder: 0 is also a multiple of 3)

Submit as an integer value with NO LaTeX or extra formatting/characters (NO COMMAS OR SPACES!!!)

120960

Q11
8 Points

A lattice path in the plane is a sequence of ordered pairs of integers $(m_1, n_1), (m_2, n_2), \ldots, (m_t, n_t)$ such that for all $i < t - 1$:

i. $m_{i+1} = m_i + 1$ and $n_{i+1} = n_i$ or
ii. $m_{i+1} = m_i$ and $n_{i+1} = n_i + 1$

Submit as an integer value with NO LaTeX or extra formatting/characters (NO COMMAS OR SPACES!!!)

Q11.1
2 Points

How many lattice paths exist from $(0, 0)$ to $(17, 15)$?

565722720

Q11.2
2 Points

How many lattice paths exist from $(7, 5)$ to $(17, 15)$?

184756

Q11.3
2 Points

How many lattice paths exist from $(0, 0)$ to $(17, 15)$ that pass through $(7, 5)$?

146326752

Q11.4
2 Points

How many lattice paths exist from $(0, 0)$ to $(17, 15)$ that do not pass through $(7, 5)$?

419395968

Q12
10 Points

This question requires a picture submission. See instructions on title page.

Count the number of ternary strings using a tree diagram (these use the digits 0, 1, 2) of length 4 such that a 1 always appears before a 0. The one does not have to be directly before the 0, 12011 is a valid string. If more than one 0 occurs in the string, then another 1 must also occur before the 2nd 0. For example. 1001 is not allowed but 1100 is. A string cannot start with a 0. Not all digits have to be used.

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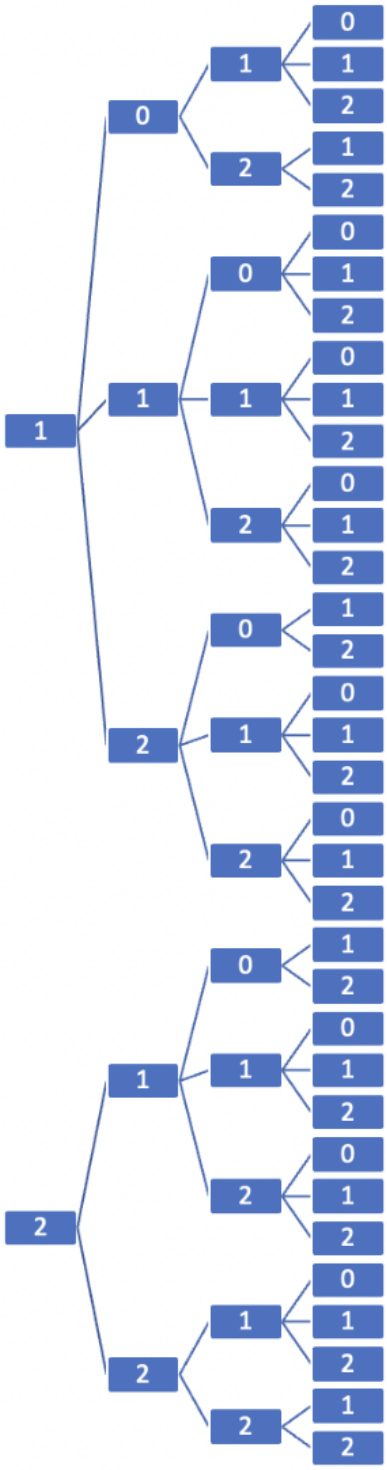
This results in **35** possible values



Q13

0 Points

Please list the names of any and all collaborators here:

CS 2050/2051 Homework 9 (HOWARD, FAULKNER, ELLEN, BRITO) ● Graded

Student
Vidit Dharmendra Pokharna

Total Points
85.5 / 100 pts

Question 1
(no title) **5** / 5 pts

Question 2
(no title) **5** / 5 pts

Question 3
(no title) **5** / 5 pts

Question 4
(no title) **5** / 5 pts

Question 5
(no title) **5** / 5 pts

Question 6
(no title) **0** / 10 pts

Question 7
(no title) **10** / 10 pts

Question 8
(no title) **20** / 20 pts

8.1 (no title) **5** / 5 pts

8.2	(no title)	**5** / 5 pts
8.3	(no title)	**5** / 5 pts
8.4	(no title)	**5** / 5 pts

Question 9

(no title)	**10** / 10 pts

Question 10

(no title)	**0** / 7 pts

Question 11

(no title)		**8** / 8 pts
11.1	(no title)	**2** / 2 pts
11.2	(no title)	**2** / 2 pts
11.3	(no title)	**2** / 2 pts
11.4	(no title)	**2** / 2 pts

Question 12

(no title)	**10** / 10 pts

Question 13

(no title)	**2.5** / 0 pts