Long Quiz #4.2 (30-Apr): CSC-2259: Discrete Structures, Sp 2020
Your answers must be to the point. Total = 50; marks for each question is shown in [ ].

LastName: FirstName

1. Fill the table below when X = #(H in 3 tosses of a coin) and p = Prob(H) in a toss. [8]

Value i of X	Associated sample points	Prob($X = i$)

Verify that the sum of probabilities above equals 1; show details. [2]

For what values of p, Prob($X = 2$) will be the larger than the probability of other values? [2]

2. Give all details of the computation of $E(X)$ when X has a Binomial probability distribution (for general $n \geq 1$). [5]

3. Consider 3 tosses of a coin with Prob(H) = 2/3. If every H gives a gain of 2 and every T gives a loss of 1, i.e., gain of -1, what would be the expected net gain? Show your computations by filling the table below. [9]

#(H)	Probability	Total net gain	Contribution to Expected net gain	Expected net gain (only 1 entry in this column)

4. Complete the sentence below and give an example of "the things" to justify the statement. [2+2]

Probability Theory finds the things that are . . . . even in presence of . . . .

5. Assune R to be the $n \times n$ relation-matix of a partial order. Give an efficient way to determine whether R gives a linear order or not. Also, an efficient way to determine from R all maximal items in the partial order. [4+4]

6. Give the structure of Hasse-diagrams of all parital orders on 3 items that are NOT linear orders. Also, give #(parital orders) for each structure. [4+4]

7. When do we say a relation is anti-symmetric? [2]

8. In what way an equivalence relation differs from a partial order? [2]