STU-33009 Week – 1 Questions

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Q1

a) Since there are 10 letters, the possible number of ways are 10 factorial, 10! = 3628800

b) The letters E and F need to be together therefore the number of ways to arrange are : 9!\*2=725760

This is due to letters E and F being arranged together which makes 2 possible ways in which E and F will be arranged with all the other possible combinations(those being 9!).

c) Total arrangements for letters of BANANA are 720/(6\*2) = 60

This is because there are 3! ways of arranging A and 2! ways of arranging N.

d) Total arrangements for drawing 3 letters from ABCDE is 5c3 = 5!/(3!\*(5-3)!) = 10

Q2

a)When a dice is rolled the possible outcomes are {1,2,3,4,5,6}.

Thus, when the die is rolled 4 times the total number of outcome sequences become N

N = 6\*6\*6\*6 = 1296

b) 150. We can get the total number of sequences required by listing out total possibilities of where 3 can be. For example (3 3 x x) where x can have 5 possibilities from the numbers {1,2,4,5,6}. This gives us 5\*5 = 25 possibilities and the total number of sequences are 25\*6 = 150. (6 being the number of ways we can arrange exactly 2 three’s)

c) 171.

Q3

1. The total number of cards is = 8!

Since there are 2 decks of cards, the total way distinct ways 8 cards can be ordered are :

8!/(2!\*2!\*2!\*2!) = 2520

b) There are 6 cases to this scenario. These cases occur when an ace of one suit is dealt with an ace of another suits(note that there are 3 remaining suits). This makes up for 3 cases and since there 2 decks of cards we get a total of 6 cases.

c) 3 ways. One case is where we get both cards of diamond suit and one for heart suit. And in the final case we get one card of heart and one of card of diamond suit.