

Department of Computer Science and Engineering (CSE)

AY: 2019-2020

Math 4441: Probability and Statistics

09/10/2020

Quiz # 1

Duration: 35 Minutes (4:10 PM – 4:45 PM)

Marks: 30

Figures in the margin indicate full marks. Answer all the questions. You can assume any missing data.

1. A child is lost at the Fantasy Kingdom Amusement Park in Ashulia, Gazipur. The father of the child believes that the probability of his being lost in the East side of the Fantasy Kingdom is p and in the West side is $(1 - p)$. The security department sends three officers to the East side and two officers to the West to look for the child. Suppose that an officer who is looking in the correct side (East or West) finds the child, independently of the others, with probability 0.3.

Assume that the value of p is $[2 + \text{ID mod } 3]$, where ID represents the rightmost two digits of your student ID. For example, if your student ID is 180041301 (do not use this ID, it is just an example, you need to calculate using your own student ID), then the value of ID is 01.

- a) Find the probability that the child is found. 5
- b) If the child is found, find the probability that he is found in the East side. 10

2. There are five red and three green balls in an urn. A random ball is selected and replaced by a ball of the other color; then a second ball is drawn.
- a) Find the probability that the second ball is red. 7
- b) Find the probability that the first ball was green given that the second ball was red? 8

Good Luck

(Understanding the question is also a part of the examination)