BRAC UNIVERSITY
Inspiring Excellence

STA201 Assignment 4

1. In a simultaneous throw of a pair of fair 6-sided dice, find the probability of getting:
   a. A sum of 8
   b. A doublet (two dice landing on the same value)
   c. A sum greater than 5
   d. A sum less than 4 or greater than 8
   e. An even number on the first die
   f. An odd number on one and an even number on the other
   g. At least one 6
   h. At least one 6, if the two faces are different

2. A bag contains 30 balls numbered 1 through 30. Suppose drawing an even numbered ball is considered a 'Success'.
   a. Two balls are drawn from the bag with replacement. Find the probability of getting:
      i. Two successes
      ii. exactly one success
      iii. at least one success
      iv. no successes
   b. Find the same four probabilities for the experiment where the two balls are drawn without replacement.

3. Suppose, you are rolling two regular six-sided dice and two four-sided dice together. Let's say, the sum of the numbers appearing on the two regular six-sided dice is 'A' and the sum of the numbers appearing on the two four-sided dice is 'B'. What is the probability that the product of A and B is 12?

4. A secondary school is offering two extracurricular classes, one in Photography and the other in Swimming. These classes are open to all of the 250 students in the school. Suppose there are 48 students in the Photography class, 34 in the Swimming class, and 12 who are in both classes. If a student is randomly chosen, what is the probability that this student is not enrolled in any one of these classes?

5. Assume that the chances of a patient suffering from high blood pressure is 60%. It is also assumed that a course of meditation reduces the risk of high blood pressure by 45% and prescription of certain drugs reduces its chances by 55%. At a time, a patient can choose any one of the two options with equal probabilities. It is given that after going through one of the two options, the patient selected at random does not suffer from high blood pressure. Find the probability that the patient chose a course of meditation?

6. Bag A contains 6 red and 7 black balls and Bag B contains 9 red and 6 black balls. One ball is transferred from Bag A to Bag B and then a ball is drawn from Bag B. The ball so drawn is found to be black in colour. Find the probability that the transferred ball was red.

7. There are three coins in a box. One is a two-headed coin, another is a fair coin, and the third is a biased coin that comes up heads 75 percent of the time. When one of the three coins is selected at random and flipped, it shows heads. What is the probability that it was the two-headed coin?