CSE230 Spring '22 (Discrete Mathematics)
Assignment 03

1. An urn contains 6 red, 7 blue, and 5 green balls. You draw out two balls and they are different colors. Given this, what is the probability that the two balls were red and blue?

2. The following is a table showing the number of regular and irregular students in CSE230 live consultation hours and their grades in the viva voce .

	Good	**Average**	**Bad**	**Total**
Regular	22	2	x	5z-5
Irregular	v	u	w	z+3
Total	23	u+2	u-v	**40**

   What is the probability that a student gets a bad grade in viva **given** that s/he is irregular in consultation? [Hint: You need to determine the unknowns first]

3. An almost out-of-business movie theatre has three categories of seats - front, middle, and rear. Of the total number of seats, 10% are front seats, 30% are middle seats, and the rest are rear seats. It is known from previous experience of movie-goers that 5% of the front seats, 10% of middle seats, and 20% of the rear seats are broken. Determine the probability of a randomly selected seat being broken.

4. An insurance company classifies people into one of the three classes – good risks, average risks and bad risks. 30% of the population are labelled as "good risk", 60% as "average risk" and the remaining as "bad risk". Their records indicate that over a 1-year span 10% of good risk people, 20% of average risk people, and 30% of bad risk people are involved in an accident.Determine the probability of a randomly selected policy holder being involved in an accident.

5. 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 color. Find the probability that the transferred ball was red.

6. Suppose there are 8 fair coins and 12 unfair coins in a bag such that the unfair coins have a 75% probability of landing heads. A coin is randomly picked from the bag and flipped 9 times. If the coin landed heads 7 times out of 9, what is the probability that the coin to be unfair?

7. Assume that the chances of the patient having a heart attack are 40%. It is also assumed that a meditation and yoga course reduces the risk of heart attack by 30% and prescription of certain drugs reduces its chances by 25%. 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 suffers a heart attack. Find the probability that the patient followed a course of meditation and yoga?