The LNM Institute of Information Technology
Jaipur, Rajsthan

Probability and Statistic ■ Assignment #1

(Probability)

Q1. Show that the set of all positive rational numbers is countably infinite.

Q2. A bag contains 4 red and 3 black balls. A second bag contains 2 red and 4 black balls. One bag is selected at random. From the selected bag one ball is drawn. Find the probability that the ball drawn is red.

Q3. A bag contains 6 red and 5 blue balls and another bag contains 5 red and 8 blue balls. A ball is drawn from the first bag and without seeing its color is put in the second bag. A ball is then drawn from the second bag. Find the probability that the ball drawn is blue in color.

Q4. The word $ASSASIN$ is given. It is rearranged so that the three S's come consecutively. Find the probability of this event.

Q5. (*Birthday Paradox*)If n people are present in a room , what is the probability at least two persons celebrate their birthday on the same day of the year?

Q6. If 15 married couples are seated at random at a round table. Find the probability that no wife sits next to her husband.

Q7. Suppose that each of N men at a party throws his hat into the center of the room. The hats are first mixed up, and then man randomly selects a hat. What is the probability that

1. none of the men selects his own hat?
2. exactly r men select his own hat?

What is the probability that none

Q8. If E_n,$n \geq 1$ is a decreasing sequence of events then prove that $\lim_{n\to\infty} P(E_n) = P(\lim_{n\to\infty} E_n)$.

Q9. An ordinary deck of 52 playing cards is randomly divided into 4 piles of 13 cards each. Compute the probability that each pile has exactly 1 ace.

Q10. If events A and B are independent then prove the A^c and B or A and B^c or A^c and B^c are also independent.

Q11. Four boxes A, B, C, D contain fuses. The boxes contain 5000, 3000, 2000, and 1000 fuses respectively. The percentage of fuses in the boxes which are defective are 3, 2, 1 and 0.5 respectively. One fuse is selected at randomly arbitrarily from one of the boxes. It is found to be a defective fuse. Find the probability that it has come from box D.