**ASSIGNMENT-1**

**MAT 2206 (CS/ICT/CC)**

1. A chartered accountant applies for a job in 2 firms X and Y. He estimates that the probability of his being selected in firm X is 0.7 and being rejected at firm Y is 0.5 and the probability of at least one of his applications being rejected is 0.6. What is the probability that he will be selected in one of the firms?.
2. A committee of 4 has to be formed from among 3 Economists, 4 Engineers, 2 Statisticians and 1 doctor. i) What is the probability that each of the 4 professions is represented on the committee?. ii) What is the probability that the committee consists of a doctor and at least one Economist?.
3. Three groups of workers contain 3 men & 1 woman, 2 men & 2 women and 1 man &3 women respectively. One worker is selected at random from each group. What is the probability that the group selected consists of 1 man and 2 women?.
4. A and B alternatively throw a pair of fair dice. A wins if he throws sum

6 before B throws a sum 7 and B wins if he throws a sum 7 before A

throws a sum 6. If A begins, show that B’s chances of winning the game is .

1. An urn contains N1 white and N2 black balls. When 2 balls are randomly drawn, the probability that both be white is 0.5. a) What is the minimum value of N1? b) What is the minimum value of N1 whenN2 is an even number?

c) What is the minimum value of the total number N = N1 + N2 of balls in the urn?

1. The experiment is the rolling a pair of fair dice. Let A be the event 1 on one die and B the event 1 on the other die. Let C be the event that the sum of dice is odd. Show that A & B are independent, B & C are independent and A & C are independent, but A, B, C are not independent events.
2. One bag contains 4 white balls and 2 black balls. Another bag contains 3 white balls and 5 black balls. If one ball is drawn from each bag, find the probability that a) both are white b) both are black c) one is white and one is black.
3. A box contains tags marked 1, 2, ......, n. Two tags are chosen at random. Find the probability that the numbers on the tags are consecutive integers if the tags are chosen with replacement and without replacement.
4. Four roads A, B, C and D lead away from a jail. A prisoner escaping from the jail selects a road at random. If road A is selected, the probability of escaping is . Similarly, for road B it is , for road C it is and for road D it is . What is the probability that the prisoner will succeed in escaping?
5. The chances that a Doctor A will diagnose a disease X correctly is 60%. The chance that a patient will die by his treatment after correct diagnosis is 40% and the chances of the death by wrong diagnosis is 70%. A patient of a Doctor A, who had disease X, died. What is the chance that his disease was diagnosed correctly?

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