Unit-4

ASSIGNMENT-4 (Probability)

Example 1: A coin is thrown 3 times .what is the probability that atleast one head is obtained?

Sol: Sample space = [HHH, HHT, HTH, THH, TTH, THT, HTT, TTT]

Total number of ways = 2 × 2 × 2 = 8. Fav. Cases = 7

P (A) = 7/8

OR

P (of getting at least one head) = 1 – P (no head)⇒ 1 – (1/8) = 7/8

Example 2: There are 5 green 7 red balls. Two balls are selected one by one without replacement. Find the probability that first is green and second is red.

Sol: P (G) × P (R) = (5/12) x (7/11) = 35/132

Example 3: What is the probability of getting a sum of 7 when two dice are thrown?

Sol: Probability math - Total number of ways = 6 × 6 = 36 ways. Favorable cases = (1, 6) (6, 1) (2, 5) (5, 2) (3, 4) (4, 3) --- 6 ways. P (A) = 6/36 = 1/6

Example 4: 1 card is drawn at random from the pack of 52 cards.

(i) Find the Probability that it is an honor card.

(ii) It is a face card.

Sol: (i) honor cards = (A, J, Q, K) 4 cards from each suits = 4 × 4 = 16

P (honor card) = 16/52 = 4/13

(ii) face cards = (J,Q,K) 3 cards from each suit = 3 × 4 = 12 Cards.

P (face Card) = 12/52 = 3/13

Example 5: A die is rolled, find the probability that the number obtained is greater than 4.

Sol: 2 / 6 = 1 / 3

Example 6: Two coins are tossed, find the probability that one <u>head</u> only is obtained.

Sol: 2 / 4 = 1 / 2

Example 7: Two dice are rolled, find the probability that the sum is equal to 5.

Sol: 4 / 36 = 1 / 9

Example 8: A card is drawn at random from a deck of cards. Find the probability of getting the King of heart.

Sol: 1 / 52

Example 9: What is the probability of getting a 2 or a 5 when a die is rolled?

Sol: Probability of getting a 2 or a 5,

P(2 or 5) = P(2) + P(5) – P(2 and 5)

==> 1/6 + 1/6 – 0

==> 2/6 = 1/3.

Example 10: In a class, 40% of the students study math and science. 60% of the students study math. What is the probability of a student studying science given he/she is already studying math?

Solution: P(M and S) = 0.40

P(M) = 0.60nb

P(S|M) = P(M and S)/P(M) = 0.40/0.60 = 2/3 = 0.67

Example 11: A single coin is tossed 5 times. What is the probability of getting at least one head?

Solution: Consider solving this using complement.

Probability of getting no head = P(all tails) = 1/32

P(at least one head) = 1 – P(all tails) = 1 – 1/32 = 31/32.

Example 12: What is the probability of the occurrence of a number that is odd or less than 5 when a fair die is rolled.

P(A) = 3/6 (odd numbers = 1,3 and 5)

P(B) = 4/6 (numbers less than 5 = 1,2,3 and 4)

P(A and B) = 2/6 (numbers that are both odd and less than 5 = 1 and 3)

Now, P(A or B) = P(A) + P(B) – P(A or B)

= 3/6 + 4/6 – 2/6

P(A or B) = 5/6.