Probability class 09 Solved Question paper -3 [2016]

Q.1 From a well shuttled pack of colds, a card is drawn at random. Find the probability of getting a black queen.

Solution. Total numbers of ways to draw a card = 52

Number of ways to drawn a black queen = 2

Therefore probability of getting a black queen = 2/52 =1/26

Q.2 A bag contains 4 red and 6 black balls. A ball is taken out of the bag at random. Find the probability of getting of black ball. [AI 2008]

Solution: No. of total outcomes = 10

No. of favourable outcomes to select a black ball = 6

Therefore probability of getting a black ball = 6/10 = 3/5

Q.3 A dice is thrown once. Find the probability of getting a number less than 3.

Solution: Number of total outcomes = (1, 2, 3, 4, 5, 6) = 6

Number which is less than 3 i.e. 1, 2

Then, number of favorable outcomes = 2

Therefore probability the probability of getting a number less than 3 = 2/6 = 1/3

Hence, required probability is

Q.4 . Cards bearing numbers 3 to 20 are placed in a bag and mixed thoroughly. A card is taken out from the bag at random. What is the probability that the number on the card taken out is an even number ?

Sol. Even numbers from 3 to 20 are 4, 6, 8, 10, 12, 14, 16, 18 = 9 numbers

Total numbers of card = 18

Therefore the probability that the number on the card taken out is an even number = 9/18=1/2

Q.5 A dice is thrown twice. What is the probability that the same number will come up either time ?

Solution: Total outcomes = 36 i.e.

(1, 1) , (1, 2), (1, 3) (1, 4), (1, 5), (1, 6)

(2, 1), (2, 2), (2, 3), (2, 4), (2, 5), (2, 6)

(3, 1), (3, 2), (3, 3), (3, 4), (3, 5), (3, 6)

(4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6)

(5, 1), (5, 2), (5, 3), (5, 4), (5, 5), (5, 6)

(6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)

Favorable outcomes = 6 {(1, 1), (2, 2), (3, 3), (4, 4), (5, 5), (6, 6)}

Therefore probability of same number either times = 6/36=1/6

Q.6. Cards, marked with numbers 5 to 50, are placed in a box and mixed thoroughly. A card is drawn from the box out random. Find the probability that the number on the taken card is

(i) a prime number less than 10 (ii) a number which is a perfect square

Solution: Total number of outcomes = 46

(i) Number of favorable outcomes for a prime number less than 10 = 2 {5, 7}

Therefore probability for prime number less than 10 = 2/46 = 1/23

(ii) Number of favorable outcomes for a perfect square = 5 {9, 16, 25, 36, 49}

Therefore probability for a perfect square = 5/56

Q.7. A card is drawn at random from a well shuffled deck of playing cards. Find the probability of drawing a

(i) face card (ii) card which is neither a king nor a red card.

Solution: Total number of outcomes = 52

(i) Number of favorable outcomes for face cards = 12

Therefore probability of drawing a face card = 12/52 = 3/13

Number of cards which are neither king nor red = 24 + 4 = 28

(Because red colour card is 26 but including king and we consider 4 kings separately)

Probability of card which is neither a king nor a red card = 28/52 = 7/13

Q.8. From a pack of 52 playing cards, jacks, queens, kings and aces of red colour are removed. From the remaining a card is drawn at random. Find the probability that the card drawn is (i) a black queen (ii) a red card (iii) a black jack (iv) a picture card or face card

Solution. Total outcomes = 52

but jacks, queens, kings and aces of red colour are removed cards are removed.

Therefore remaining cards = 52 – 8 = 44

(i) Favorable cases for a black queen are 2

Therefore the probability of black queen drawn2/44=1/22

(ii) Favorable outcomes for red cards are 26 – 8 = 18 (i.e. a diamonds + 9 hearts)

Therefore probability of drawing a red card = 18/44 = 9/22

(iii) Favorable outcomes for a black jack are 2 (i.e. jacks of club or spade)

Therefore required probability = 2/44 = 1/22

(iv) Favorable outcomes for a picture card = 6 (i.e. 2 black jack + 2 queens + 2 kings)

Therefore probability of drawing a picture card = 6/44 = 3/22

Q.9. Two dice are thrown simultaneously. What is the probability of getting two numbers whose product is even ?

Solution: Total number of cases = 36
Favourable cases = (1,2),(1,4),(1,6),(2,1),(2,2), (2,3),(2,4),(2,5),(2,6),(3,2),(3,4),(3,6),(4,1),(4,2), (4,3), (4,4), (4,5), (4,6),(5,2), (5,4),(5,6),(6,1),(6,2),(6,3),(6,4),(6,5),(6,6)] = 27

So Probability of getting two numbers whose product is even = 27/36 = ¾
Q.10. A die is drop at random on the rectangular region as shown in figure. What is the probability that it will land inside the circle with diameter 1m ?

Sol. Area of rectangular region = 3m × 2m = $6m^2$ Area of circle = $\pi r^2 = \pi \left(\frac{1}{2}\right)^2 = \pi/4$

Probability that die will land inside the circle = $\pi/4 \div 6 = \pi/24$
11. A bag contains 12 balls out of which x are white.
(i) If one ball is drawn at random, what is the probability it will be a white ball ?
(ii) If 6 more white balls are put in the box. The probability of drawing a white ball will be double than that is in case (i). Find x.
Solution: Total number of balls = 12 Total number of black balls = x
P (getting a black ball) = x/12
Now if 6 more black balls are put in the box, then Total number of balls = 12 + 6 = 18
Total number of black balls = $x + 6 \Rightarrow$ P (getting a black ball now) = (x+6)/18
$\Rightarrow 2(x/12) = (x+6)/18 \Rightarrow 3x = x+6 \Rightarrow x = 3$