Probability Questions and Answers for Competitive Exams Pdf

1. A box contains 4 red, 5 green and 6 white balls. A ball is drawn at random from the box. What is the probability that the ball drawn is either red or green?

a. 2/5

b. 3/5

c. 1/5

d. 7/15

Ans: B

Total number of balls = (4 + 5 + 6) = 15. P(drawing a red ball or a green ball) = P(red) + P(green)

 $= \left(\frac{4}{15} + \frac{5}{15}\right) = \frac{9}{15} = \frac{3}{5}.$

2. An urn contains 3 red, 3 green and 2 blue balls. If 2 balls are drawn at random, find the probability that no ball is blue.

a. 5/7

b. 10/21

c. 2/7

d. 11/21

Ans: B

Total number of balls = (2 + 3 + 2) = 7. Let *E* be the event of drawing 2 non-blue balls.

Then,
$$n(E) = {}^{5}C_{2} = \frac{5 \times 4}{2 \times 1} = 10.$$

And, $n(S) = {}^{7}C_{2} = \frac{7 \times 6}{2 \times 1} = 21.$
 $\therefore P(E) = \frac{n(E)}{n(S)} = \frac{10}{21}.$

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

a. 1/2

b. 3/4

c. 3/8

d. 5/16

Ans: B

In a simultaneous throw of two dice, we have n (S) = $(6 \times 6) = 36$.

Let E = event of getting two numbers whose product is even.

Then, $E = \{(1, 2), (1, 4), (1, 6), (2, 1), (2, 2), (2, 3), (2, 4), (2, 5), (2, 6), (3, 2), (3, 4), (3, 6), (4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6), (5, 2), (5, 4), (5, 6), (6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)\}.$ $\therefore \quad n(E) = 27.$ $\therefore \quad P(E) = \frac{n(E)}{n(S)} = \frac{27}{36} = \frac{3}{4}.$

4. A box contains 10 black and 10 white balls. What is the probability of drawing 2 balls of the same colour?

a. 9/19

b. 9/38

c. 10/19

d. 5/19

Ans: A

Total number of balls = (10 + 10) = 20.

Let *E* be the event of drawing 2 balls of the same colour. n(E) = number of ways of drawing 2 black balls or 2 white balls

$$n(E) = ({}^{10}C_2 + {}^{10}C_2) = 2 \times {}^{10}C_2 = 2 \times \frac{10 \times 9}{2 \times 1} = 90.$$

n(S) = number of ways of drawing 2 balls out of 20

$$= {}^{20}C_2 = \frac{20 \times 19}{2 \times 1} = 190.$$

$$\therefore P(E) = \frac{n(E)}{n(S)} = \frac{90}{190} = \frac{9}{19}.$$

5. An urn contains 6 red, 4 blue, 2 green and 3 yellow marbles. If two marbles are drawn at random from the urn, what is the probability that both are red?

- a. 1/6
- b. 1/7
- c. 2/15
- d.2/5
- Ans: B

Total number of balls = (6 + 4 + 2 + 3) = 15. Let *E* be the event of drawing 2 red balls.

Then,
$$n(E) = {}^{6}C_{2} = \frac{6 \times 5}{2 \times 1} = 15.$$

Also, $n(S) = {}^{15}C_{2} = \frac{15 \times 14}{2 \times 1} = 105.$
 $\therefore P(E) = \frac{n(E)}{n(S)} = \frac{15}{105} = \frac{1}{7}.$

6. A basket contains 4 red, 5 blue and 3 green marbles. If three marbles are picked up at random what is the probability that at least one is blue?

a. 7/12

b.37/44

c. 5/12

d.7/44

Ans: B

Total number of marbles = (4 + 5 + 3) = 12. Let *E* be the event of drawing 3 marbles such that none

is blue.

Then, n(E) = number of ways of drawing 3 marbles out of $7 = {}^{7}C_{3} = \frac{7 \times 6 \times 5}{3 \times 2 \times 1} = 35$. And, $n(S) = {}^{12}C_{3} = \frac{12 \times 11 \times 10}{3 \times 2 \times 1} = 220$. $\therefore P(E) = \frac{n(E)}{n(S)} = \frac{35}{220} = \frac{7}{44}$.

Required probability = $1 - P(E) = \left(1 - \frac{7}{44}\right) = \frac{37}{44}$.

7. Four persons are chosen at random from a group of 3 men, 2 women and 4 children. The chance that exactly 2 of them are children, is a. 1/9

b. 1/5

c. 1/12

d.10/21

Ans: D

n(S) = number of ways of choosing 4 persons out of 9

$$= {}^{9}C_4 = \frac{9 \times 8 \times 7 \times 6}{4 \times 3 \times 2 \times 1} = 126.$$

n(E) = Number of ways of choosing 2 children out of 4 and 2 persons out of (3 + 2) persons

$$n(E) = {}^{4}C_{2} \times {}^{5}C_{2} = \left(\frac{4 \times 3}{2 \times 1} \times \frac{5 \times 4}{2 \times 1}\right) = 60.$$

$$\therefore \quad P(E) = \frac{n(E)}{n(S)} = \frac{60}{126} = \frac{10}{21}.$$

8. In a box, there are 8 red, 7 blue and 6 green balls. One ball is picked up randomly. What is the probability that it is neither red nor green?

- a. 2/3
- b. 3/4
- c. 7/19
- d. 8/21
- e. 9/21
- Ans: D

Total number of balls = (8 + 7 + 6) = 21. Let E = Event that the ball drawn is neither red nor green = Event that the ball drawn is red. \therefore n(E) = 8.

$$\therefore P(E) = \frac{8}{21}.$$

9. A bag contains 6 black and 8 white balls. One ball is drawn at random. What is the probability that the ball drawn is white?

a. 3/4

b. 4/7

c. 1/8

d. 3/7

Ans: B

Total number of balls = (6 + 8) = 14. Number of white balls = 8. $P(\text{drawing a white ball}) = \frac{8}{14} = \frac{4}{7}$.

10. From a pack of 52 cards, one card is drawn at random. What is the probability that the card drawn is a ten or a spade?

a. 4/13

b. 1/4

c. 1/13

d. 1/26

Ans: A

Here, n(S) = 52.

There are 13 spades (including one ten) and there are 3 more tens.

Let E = event of getting a ten or a spade.

Then,
$$n(E) = (13 + 3) = 16$$

 $\therefore P(E) = \frac{n(E)}{n(S)} = \frac{16}{52} = \frac{4}{13}.$

11. A basket contains 4 red, 5 blue and 3 green marbles. If 2 marbles are drawn at random from the basket, what is the probability that both are red?

a. 3/7

b.1/2

c. 1/11

d. 1/6

Ans: C

Total number of balls = (4 + 5 + 3) = 12. Let *E* be the event of drawing 2 red balls. Then, $n(E) = {}^{4}C_{2} = \frac{4 \times 3}{2 \times 1} = 6$. Also, $n(S) = {}^{12}C_{2} = \frac{12 \times 11}{2 \times 1} = 66$. $\therefore P(E) = \frac{n(E)}{n(S)} = \frac{6}{66} = \frac{1}{11}$.

12. In a single throw of a die, what is the probability of getting a number greater than 4?

a. 1/2

b. 1/3

c. 2/3

d. 1/4

Ans: B

When a die is thrown, we have $S = \{1, 2, 3, 4, 5, 6\}$. Let E = event of getting a number greater than $4 = \{5, 6\}$.

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$$P(E) = \frac{n(E)}{n(S)} = \frac{2}{6} = \frac{1}{3}$$
.

13. In a simultaneous throw of two coins, the probability of getting at least one head

is

a. 1/2b. 1/3c. 2/3d. 3/4Ans: D Here $S = \{HH, HT, TH, TT\}$. Let E = event of getting at least one head = $\{HT, TH, HH\}$. $\therefore P(E) = \frac{n(E)}{n(S)} = \frac{3}{4}$.

14. Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn bears a number which is a multiple of 3?

a. 3/10

b. 3/20

c. 2/5

d. 1/2

Ans: A

Here, $S = \{1, 2, 3, 4, \dots, 19, 20\}$. Let E = event of getting a multiple of $3 = \{3, 6, 9, 12, 15, 18\}$. $\therefore P(E) = \frac{n(E)}{n(S)} = \frac{6}{20} = \frac{3}{10}$. 15. Two dice are tossed. The probability that the total score is a prime number is

a. 1/6

b. 1/2

c. 5/12

d. 7/9

Ans: C

Clearly, $n(S) = (6 \times 6) = 36$. Let *E* be the event that the sum is a prime number. Then, $n(E) = \{(1, 1), (1, 2), (1, 4), (1, 6), (2, 1), (2, 3), (2, 5), (3, 2), (3, 4), (4, 1), (4, 3), (5, 2), (5, 6), (6, 1), (6, 5)\}$ $\therefore \quad n(E) = 15.$ $P(E) = \frac{n(E)}{n(S)} = \frac{15}{36} = \frac{5}{12}.$