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

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

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\begin{aligned}
n(E) & =\left({ }^{10} C_{2}+{ }^{10} C_{2}\right)=2 \times{ }^{10} C_{2}=2 \times \frac{10 \times 9}{2 \times 1}=90 . \\
n(S) & =\text { number of ways of drawing } 2 \text { balls out of } 20 \\
& ={ }^{20} C_{2}=\frac{20 \times 19}{2 \times 1}=190 . \\
\therefore \quad P(E) & =\frac{n(E)}{n(S)}=\frac{90}{190}=\frac{9}{19} .
\end{aligned}
$$

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, $n(S)={ }^{15} C_{2}=\frac{15 \times 14}{2 \times 1}=105$.
$\therefore \quad P(E)=\frac{n(E)}{n(S)}=\frac{15}{105}=\frac{1}{7}$.
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, $n(S)={ }^{12} C_{3}=\frac{12 \times 11 \times 10}{3 \times 2 \times 1}=220$.
$\therefore \quad P(E)=\frac{n(E)}{n(S)}=\frac{35}{220}=\frac{7}{44}$.
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

$$
\begin{aligned}
& n(E)=\left({ }^{4} C_{2} \times{ }^{5} C_{2}\right)=\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} \text {. }
\end{aligned}
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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.
$\therefore \quad n(E)=8$.
$\therefore \quad P(E)=\frac{8}{21}$.
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 $=8$.
$P($ 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, $\quad n(E)=(13+3)=16$.
$\therefore \quad P(E)=\frac{n(E)}{n(S)}=\frac{16}{52}=\frac{4}{13}$.
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 $4=\{5,6\}$.
$\therefore \quad P(E)=\frac{n(E)}{n(S)}=\frac{2}{6}=\frac{1}{3}$.
13. In a simultaneous throw of two coins, the probability of getting at least one head is
a. $1 / 2$
b. $1 / 3$
c. $2 / 3$
d. $3 / 4$

Ans: D
Here $S=\{\mathrm{HH}, \mathrm{HT}, \mathrm{TH}, \mathrm{TT}\}$.
Let $E=$ event of getting at least one head $=\{\mathrm{HT}, \mathrm{TH}$, HH \}.

$$
\therefore \quad P(E)=\frac{n(E)}{n(S)}=\frac{3}{4} .
$$

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, $S=\{1,2,3,4, \ldots ., 19,20\}$.
Let $E=$ event of getting a multiple of $3=\{3,6,9,12,15,18\}$.
$\therefore \quad P(E)=\frac{n(E)}{n(S)}=\frac{6}{20}=\frac{3}{10}$.
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,
$n(E)=\{(1,1),(1,2),(1,4),(1,6),(2,1),(2,3),(2,5),(3,2)$,
$(3,4),(4,1),(4,3),(5,2),(5,6),(6,1),(6,5)\}$
$\therefore \quad n(E)=15$.

$$
P(E)=\frac{n(E)}{n(S)}=\frac{15}{36}=\frac{5}{12} .
$$

