

RD Sharma Class 10 Solutions Chapter 13 Probability Ex MCQS

Question 1.

Mark the correct alternative in each of the following:

If a digit is chosen at random from the digits 1, 2, 3, 4, 5, 6, 7, 8, 9, then the probability that it is odd, is

- (a) $\frac{4}{9}$ (b) $\frac{5}{9}$ (c) $\frac{1}{9}$ (d) $\frac{2}{3}$

Solution:

Total number of digits from 1 to 9 (n) = 9

Numbers which are odd (m) = 1, 3, 5, 7, 9 = 5

$$\therefore \text{Probability } \frac{m}{n} = \frac{5}{9} \quad \text{(b)}$$

Question 2.

In Q. No. 1, the probability that the digit is even, is

- (a) $\frac{4}{9}$ (b) $\frac{5}{9}$ (c) $\frac{1}{9}$ (d) $\frac{2}{3}$

Solution:

Total numbers of digits from 1 to 9 (n) = 9

Numbers which are even (m) = 2, 4, 6, 8 = 4

$$\therefore \text{Probability} = \frac{m}{n} = \frac{4}{9} \quad \text{(a)}$$

Question 3.

In Q. No. 1, the probability that the digit is a multiple of 3 is

- (a) $\frac{1}{3}$ (b) $\frac{2}{3}$ (c) $\frac{1}{9}$ (d) $\frac{2}{9}$

Solution:

Total numbers of digits for 1 to 9 (n) = 9

Number divisible by 3 (m) = 3, 6, 9 = 3

$$\therefore \text{Probability} = \frac{m}{n} = \frac{3}{9} = \frac{1}{3} \quad \text{(a)}$$

Question 4.

If three coins are tossed simultaneously, then the probability of getting at least two heads, is

- (a) $\frac{1}{4}$ (b) $\frac{3}{8}$ (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

Solution:

Three coins are tossed simultaneously, then possible events will be $(n) = 2 \times 2 \times 2 = 8$
The results will be
(HHT), (HTH), (THH), (THT), (TTH), (HTT), (HHH), (TTT)
 \therefore Probability of getting at least two heads are

$$= \frac{m}{n} = \frac{4}{8} = \frac{1}{2} \quad \text{(c)}$$

Question 5.

In a single throw of a die, the probability of getting a multiple of 3 is

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{6}$ (d) $\frac{2}{3}$

Solution:

A die is thrown, the possible number of events $(n) = 6$
Now multiple of 3 are 3, 6 which are 2
 $\therefore m = 2$

$$\therefore \text{Probability} = \frac{m}{n} = \frac{2}{6} = \frac{1}{3} \quad \text{(b)}$$

Question 6.

The probability of guessing the correct answer to a certain test questions is $\frac{x}{12}$. If the probability of not guessing the correct answer to this question is $\frac{2}{3}$, then $x =$

- (a) 2
(b) 3
(c) 4
(d) 6

Solution:

Probability of guessing the correct answer

$$= \frac{x}{12}$$

and probability of not guessing the correct

$$\text{answer} = \frac{2}{3}$$

$$\therefore \frac{x}{12} + \frac{2}{3} = 1 \quad (A + \bar{A} = 1)$$

$$\Rightarrow \frac{x}{12} = 1 - \frac{2}{3} = \frac{1}{3} \Rightarrow x = \frac{12}{3} = 4$$

$$\therefore x = 4 \quad \text{(c)}$$

Question 7.

A bag contains three green marbles, four blue marbles and two orange marbles. If a

marble is picked at random, then the probability that it is not an orange marble is

- (a) $\frac{1}{4}$ (b) $\frac{1}{3}$ (c) $\frac{4}{9}$ (d) $\frac{7}{9}$

Solution:

In a bag, there are 3 green, 4 blue and 2 orange marbles

\therefore Total marbles (n) = 3 + 4 + 2 = 9

No. of marbles which is not orange = 3+4=7

\therefore m = 7

$$\therefore \text{Probability} = \frac{m}{n} = \frac{7}{9} \quad (\text{d})$$

Question 8.

A number is selected at random from the numbers 3, 5, 5, 7, 7, 7, 9, 9, 9, 9. The probability that the selected number is their average is

- (a) $\frac{1}{10}$ (b) $\frac{3}{10}$ (c) $\frac{7}{10}$ (d) $\frac{9}{10}$

Solution:

Total numbers are $\Sigma x_i = 10$

x	f
3	= 1
5	= 2
7	= 3
9	= 4

$$\text{Average} = \frac{3 \times 1 + 5 \times 2 + 7 \times 3 + 9 \times 4}{10}$$

$$= \frac{3 + 10 + 21 + 36}{10} = \frac{70}{10} = 7$$

\therefore m = 3

$$\therefore \text{Probability of average number} = \frac{3}{10} \quad (\text{b})$$

Question 9.

The probability of throwing a number greater than 2 with a fair dice is

- (a) $\frac{3}{5}$ (b) $\frac{2}{5}$ (c) $\frac{2}{3}$ (d) $\frac{1}{3}$

Solution:

\therefore A dice has 6 numbers

\therefore n = 6

Numbers greater than 2 are 3, 4, 5, 6

$$\therefore m = 4$$

$$\text{Probability} = \frac{m}{n} = \frac{4}{6} = \frac{2}{3} \quad (\text{c})$$

Question 10.

A card is accidentally dropped from a pack of 52 playing cards. The probability that it is an ace is

(a) $\frac{1}{4}$ (b) $\frac{1}{13}$

(c) $\frac{1}{52}$ (d) $\frac{12}{13}$

Solution:

No. of card in a pack (n) = 52

A card is drawn at random

\therefore No. of ace (m) = 4

$$\therefore \text{Probability of an ace} = \frac{m}{n} = \frac{4}{52} = \frac{1}{13} \quad (\text{b})$$

Question 11.

A number is selected from numbers 1 to 25. The probability that it is prime is

(a) $\frac{2}{3}$ (b) $\frac{1}{6}$

(c) $\frac{1}{3}$ (d) $\frac{5}{6}$

Solution:

A number is selected from the numbers 1 to 25

Probability of prime number which are 2, 3, 5, 7, 11, 13, 17, 19, 23 = 9

$$\therefore P(E) = \frac{m}{n} = \frac{9}{25}$$

Question 12.

Which of the following cannot be the probability of an event?

(a) 23

(b) -1.5

(c) 15%

(d) 0.7

Solution:

-1.5 cannot be the probability as it is always from 0 to 1 which is always positive (b)

Question 13.

If $P(E) = 0.05$, then $P(\text{not } E) =$

- (a) – 0.5
- (b) 0.5
- (c) 0.9
- (d) 0.95

Solution:

$$P(E) = 0.05$$

$$\therefore P(E) + P(\text{not } E) = 1$$

$$\therefore P(\text{not } E) = 1 - P(E) = 1 - 0.05 = 0.95 \text{ (d)}$$

Question 14.

Which of the following cannot be the probability of occurrence of an event ?

- (a) 0.2
- (b) 0.4
- (c) 0.8
- (d) 1.6

Solution:

Probability of occurrence of an event = 1.6 (d)

Question 15.

The probability of a certain event is

- (a) 0
- (b) 1
- (c) 12
- (d) No existent

Solution:

Probability of a certain event = 1 (b)

Question 16.

The probability of an impossible event is

- (a) 0
- (b) 1
- (c) 12
- (d) Non – existent

Solution:

Probability of an impossible event = 0 (a)

Question 17.

Aarushi sold 100 lottery tickets in which 5 tickets carry prizes. If Priya purchased a ticket, what is the probability of Priya winning a prize ?

- (a) $\frac{19}{20}$
- (b) $\frac{1}{25}$
- (c) $\frac{1}{20}$
- (d) $\frac{17}{20}$

Solution:

No. of lottery tickets = 100

No. of tickets carrying prizes = 5

∴ Probability of ticket buying a prized one

$$\frac{m}{n} = \frac{5}{100} = \frac{1}{20} \quad (c)$$

Question 18.

A number is selected from first 50 natural numbers. What is the probability that it is a multiple of 3 or 5 ?

- (a) $\frac{13}{25}$ (b) $\frac{21}{50}$
(c) $\frac{12}{25}$ (d) $\frac{23}{50}$

Solution:

Total numbers = 1 to 50 = 50

Numbers which are multiples of 3 or 5, are 3, 5, 6, 9, 10, 12, 15, 18, 20, 21, 24, 25, 27, 30, 33, 35, 36, 39, 40, 42, 45, 48, 50 = 23

$$\therefore P(E) = \frac{m}{n} = \frac{23}{50} \quad (d)$$

Question 19.

A month is selected at random in a year. The probability that it is March or October, is

- (a) $\frac{1}{12}$ (b) $\frac{1}{6}$
(c) $\frac{3}{4}$ (d) None of these

Solution:

No. of months in a year = 12

Probability of being March or October = $\frac{2}{12}$

$$= \frac{1}{6} \quad (b)$$

Question 20.

From the letters of the word "MOBILE", a letter is selected. The probability that the letter is a vowel, is

- (a) $\frac{1}{3}$ (b) $\frac{3}{7}$
(c) $\frac{1}{6}$ (d) $\frac{1}{2}$

Solution:

No. of total letters in the word MOBILE = 6

No. of vowels = o, i, e = 3

$$\therefore \text{Probability of being a vowel} = \frac{3}{6} = \frac{1}{2} \quad (\text{d})$$

Question 21.

A die is thrown once. The probability of getting a prime number is

- (a) $\frac{2}{3}$ (b) $\frac{1}{3}$
(c) $\frac{1}{2}$ (d) $\frac{1}{6}$ [CBSE 2013]

Solution:

Prime number on a die are 2, 3, 5

\therefore Probability of getting a prime number on the face of the die

$$= \frac{3}{6} = \frac{1}{2} \quad (\text{c})$$

Question 22.

The probability of getting an even, number, when a die is thrown once is

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$
(c) $\frac{1}{6}$ (d) $\frac{5}{6}$ [CBSE 2013]

Solution:

Even number on a die are 2, 4, 6

\therefore Probability (P) = $\frac{3}{6} = \frac{1}{2}$ (a)

Question 23.

A box contains 90 discs, numbered from 1 to 90. If one disc is drawn at random from the box, the probability that it bears a prime number less than 23, is

- (a) $\frac{7}{90}$ (b) $\frac{10}{90}$
(c) $\frac{4}{45}$ (d) $\frac{9}{89}$ [CBSE 2013]

Solution:

Number of discs in a box = 90

Numbered on it are 1 to 90

Prime numbers less than 23 are = 2, 3, 5, 7, 11, 13, 17, 19 = 8

Probability of a number being a prime less

$$\text{than } 23 = \frac{8}{90} = \frac{4}{45} \quad (\text{c})$$

Question 24.

The probability that a number selected at random from the numbers 1, 2, 3,,15 is a multiple of 4, is

(a) $\frac{4}{15}$ (b) $\frac{2}{15}$

(c) $\frac{1}{5}$ (d) $\frac{1}{3}$

Solution:

Total outcomes = 15

(∵ 15 numbers are given)

Favourable outcomes for a multiple of 4 = 3 (i.e. 4, 8, 12)

∴ Probability of selecting a number which is

$$\text{a multiple of 4} = \frac{3}{15} = \frac{1}{5} \quad (\text{c})$$

Question 25.

Two different coins are tossed simultaneously. The probability of getting at least one head is

(a) $\frac{1}{4}$ (b) $\frac{1}{8}$

(c) $\frac{3}{4}$ (d) $\frac{7}{8}$

Solution:

When two different coins are tossed simultaneously, then total possibilities = 4, i.e. (H, H), (H, T), (T, H), (T, T)

Number of favourable outcomes for at least one head = 3, i.e. (H, T), (T, H), (H, H).

$$\therefore \text{Probability of getting at least one head} = \frac{3}{4} \quad (\text{c})$$

Question 26.

If two different dice are rolled together, the probability of getting an even number

- (a) $\frac{1}{36}$ (b) $\frac{1}{2}$
 (c) $\frac{1}{6}$ (d) $\frac{1}{4}$ [CBSE 2014]

Solution:

Rolling two different dice,

Number of total events = $6 \times 6 = 36$

Number of even number on both dice are 22, 24, 26, 42, 44, 46, 62, 64, 66 = 9

$$\therefore \text{Probability} = \frac{9}{36} = \frac{1}{4} \quad \text{(d)}$$

Question 27.

A number is selected at random from the numbers 1 to 30. The probability that it is a prime number is

- (a) $\frac{2}{3}$ (b) $\frac{1}{6}$
 (c) $\frac{1}{3}$ (d) $\frac{11}{30}$

Solution:

Total outcomes of selecting a number from 30 numbers = 30

Favourable numbers (prime numbers) = 10,

i.e., (2, 3, 5, 7, 11, 13, 17, 19, 23, 29)

\therefore Probability of selecting a prime number

$$= \frac{10}{30} = \frac{1}{3} \quad \text{(c)}$$

Question 28.

A card is drawn at random from a pack of 52 cards. The probability that the drawn card is not an ace is

- (a) $\frac{1}{13}$ (b) $\frac{9}{13}$
 (c) $\frac{4}{13}$ (d) $\frac{12}{13}$ [CBSE 2014]

Solution:

Total events = 52 cards

Probability of card which is not in ace Number of card = $52 - 4 = 48$

$$\therefore \text{Probability} = \frac{48}{52} = \frac{12}{13} \quad \text{(d)}$$

Question 29.

A number x is chosen at random from the numbers $-3, -2, -1, 0, 1, 2, 3$ the probability that $|x| < 2$ is

(a) $\frac{5}{7}$ (b) $\frac{2}{7}$

(c) $\frac{3}{7}$ (d) $\frac{1}{7}$

Solution:

Total possible number of events $(n) = 7$

Now $|x| < 2$

$$x < 2 \text{ or } -x < 2 \Rightarrow x > -2$$

$\therefore x$

$$\Rightarrow x = 1, 0, -1, -2, -3 \text{ or } x = -1, 0, 1, 2, 3$$

$$\therefore x = -1, 0, 1$$

$$\therefore m = 3$$

$$\therefore \text{Probability} = \frac{m}{n} = \frac{3}{7} \quad \text{(c)}$$

Question 30.

If a number x is chosen from the numbers $1, 2, 3$ and a number is selected from the numbers $1, 4, 9$, then $P(xy < 9)$

(a) $\frac{7}{9}$ (b) $\frac{5}{9}$

(c) $\frac{2}{3}$ (d) $\frac{1}{9}$

Solution:

Numbers $x = 1, 2, 3$ and $y = 1, 4, 9$

Now $xy = 1, 4, 9, 2, 8, 18, 3, 12, 27 = 9$

$$\therefore n = 9$$

and $xy < 9$ are $1, 2, 3, 4, 8$

$$\therefore m = 5$$

$$\therefore P(xy < 9) = \frac{5}{9} \quad \text{(b)}$$

Question 31.

The probability that a non-leap year has 53 Sundays, is

(a) $\frac{2}{7}$ (b) $\frac{5}{7}$

(c) $\frac{6}{7}$ (d) $\frac{1}{7}$

Solution:

In a non leap years, number of days = 365 i.e. 52 weeks + 1 day
∴ Probability of being 53 Sundays

$$= \frac{m}{n} = \frac{1}{\text{No. of day in a week}} = \frac{1}{7} \quad (\text{d})$$

Question 32.

In a single throw of a pair of dice, the probability of getting the sum a perfect square is

- (a) $\frac{1}{18}$ (b) $\frac{7}{36}$
(c) $\frac{1}{6}$ (d) $\frac{2}{9}$

Solution:

A pair of dice is thrown simultaneously

∴ No. of total events (n) = 6 x 6 = 36

Which are

- (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)

∴ Event whose sum is a perfect square are (1,3), (2, 2), (3, 1), (3, 6), (4, 5), (5, 4), (6, 3)

∴ m = 7

$$\therefore \text{Probability} = \frac{m}{n} = \frac{7}{36} \quad (\text{b})$$

Question 33.

What is the probability that a non-leap year has 53 Sundays ?

- (a) $\frac{6}{7}$ (b) $\frac{1}{7}$
(c) $\frac{5}{7}$ (d) None of these

Solution:

No. of days in a non leap year = 365

∴ No. of days more than complete weeks = 1 day

∴ Probability of 53 Sundays in a non-leap year

$$= \frac{m}{n} = \frac{1}{7} \quad (\text{b})$$

Question 34.

Two numbers 'a' and 'b' are selected successively without replacement in that order from the integers 1 to 10. The probability that ab is an integer, is

- (a) $\frac{17}{45}$ (b) $\frac{1}{5}$
(c) $\frac{17}{90}$ (d) $\frac{8}{45}$

Solution:

a and b are two number to be selected from the integers = 1 to 10 without replacement of a and b

i.e., 1 to 10 = 10

and 2 to 10 = 9

No. of ways = $10 \times 9 = 90$

Probability of ab where it is an integer

∴ Possible event will be

= (2, 2), (3, 3), (4, 2), (4, 4), (5, 5), (6, 2), (6, 3), (6, 6), (7, 7), (8, 2), (8, 4), (8, 8), (9, 3), (9, 9), (10, 2), (10, 5), (10, 10), = 17

$$P(E) = \frac{m}{n} = \frac{17}{90} \quad (c)$$

Question 35.

Two dice are rolled simultaneously. The probability that they show different faces is

- (a) $\frac{2}{3}$ (b) $\frac{1}{6}$
(c) $\frac{1}{3}$ (d) $\frac{5}{6}$

Solution:

Two dice are rolled simultaneously

∴ No. of total events = $6 \times 6 = 36$

∴ No. of different face can be

= $36 - (\text{same faces})$

Same face are (1, 1), (2, 2), (3, 3), (4, 4), (5, 5) and (6, 6) = 6

∴ $36 - 6 = 30$

$$\therefore \text{Probability } P(E) = \frac{m}{n} = \frac{30}{36} = \frac{5}{6} \quad (d)$$

Question 36.

What is the probability that a leap year has 52 Mondays ?

(a) $\frac{2}{7}$

(b) $\frac{4}{7}$

(c) $\frac{5}{7}$

(d) $\frac{6}{7}$

Solution:

No. of days in a leap year = 366

No. of Mondays = 52

Extra days = $366 - 52 \times 7$

= $366 - 364 = 2$

∴ Remaining days in the week = $7 - 2 = 5$

∴ Probability of being 52 Mondays in the leap

year = $\frac{5}{7}$ (c)

Question 37.

If a two digit number is chosen at random, then the probability that the number chosen is a multiple of 3, is

(a) $\frac{3}{10}$

(b) $\frac{29}{100}$

(c) $\frac{1}{3}$

(d) $\frac{7}{25}$

Solution:

Total number of two digit numbers are 10 to 99

= $99 - 9 = 90$

Multiples of 3 will be 12, 15, 18, 21, ..., 99

= $33 - 3 = 30$

∴ Probability = $\frac{30}{90} = \frac{1}{3}$ (c)

Question 38.

Two dice are thrown together. The probability of getting the same number on both dice is

(a) $\frac{1}{2}$

(b) $\frac{1}{3}$

Solution:

2 dice are thrown together

∴ Number of total outcomes = $6 \times 6 = 36$

Number which should come together are (1, 1), (2, 2), (3, 3), (4, 4), (5, 5), (6, 6)

= 6 pairs

(c) $\frac{1}{6}$

(d) $\frac{1}{12}$ [CBSE 2012]

Question 39.

In a family of 3 children, the probability of having at least one boy is

(a) $\frac{7}{8}$

(b) $\frac{1}{8}$

(c) $\frac{5}{8}$

(d) $\frac{3}{4}$ [CBSE 2014]

Solution:

Number of children in a family = 3

There can be,

bbb.bbg, bbg and ggg

∴ Probability of a family having atleast one boy = $\frac{3}{4}$ (d)

= $\frac{3}{4}$

(d)

Question 40.

A bag contains cards numbered from 1 to 25. A card is drawn at random from the bag. The probability that the number on this card is divisible by both 2 and 3 is

(a) $\frac{1}{5}$

(b) $\frac{3}{25}$

(c) $\frac{4}{25}$

(d) $\frac{2}{25}$

Solution:

Total number of outcomes = 25

The number which is divisible by both 2 and 3 are 6, 12, 18, 24.

Number of favourable outcomes = 4 Probability of number which is divisible by both 2 and 3 = $\frac{4}{25}$ (c)