



Class 9 Maths – Chapter 7



End-of-Chapter Exercises – Questions with Answer Key

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The Chapter 7 end-of-chapter section contains **15 questions**, including several ★ **higher-order-thinking questions**. The textbook notes that starred questions are intended for deeper reasoning rather than routine assessment.

1. Fill in the Blanks

(i)

The probability of an impossible event is _____.

(ii)

The probability of a certain event is _____.

(iii)

Probability of an event always lies between _____ and _____.

(iv)

If an event has an equal chance of happening and not happening, its probability is _____.



Answer Key

(i) 0

(ii) 1

(iii) 0 and 1

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

2. Probability Scale

For each situation, identify whether the event is:

- Impossible 
- Less likely 
- Equally likely 
- More likely 
- Certain 

(i) The sun will rise tomorrow.

(ii) A fair die will show a number greater than 6.

(iii) A fair coin will show heads.

(iv) A fair die will show an even number.

(v) A fair die will show a number between 1 and 6.

Answer Key

Event	Probability	Classification
Sun rises tomorrow	1	 Certain
Die > 6	0	 Impossible
Coin → Heads	1/2	 Equally likely
Die → Even number	1/2	 Equally likely
Die → 1 to 6	1	 Certain

3. Sample Space

Write the sample space for:

(i) Tossing a coin once

$$S = \{H, T\}$$

(ii) Rolling a die once

$$S = \{1, 2, 3, 4, 5, 6\}$$

(iii) Choosing an integer from -5 to $+5$

$$S = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$$

(iv) A box containing 5 green and 7 red balls; one ball is drawn

If only colour is recorded:

$$S = \{\text{Green, Red}\}$$

The textbook explicitly uses these types of sample-space questions.

4. Village Fair

At a village fair there are three snacks:

-  Samosa
-  Pakora
-  Bhaji

and two drinks:

-  Chai
-  Lassi

(i) Write the sample space.

 **Answer:**

$$S = \{$$

(Samosa, Chai),

(Samosa, Lassi),

(Pakora, Chai),
(Pakora, Lassi),
(Bhaji, Chai),
(Bhaji, Lassi)
}

(ii) Write the event "Selecting Samosa".

 **Answer:**

$E = \{$
(Samosa, Chai),
(Samosa, Lassi)
 $\}$

This is the exact type of sample-space/event question in the textbook.

5. Coin Toss

A fair coin is tossed **twice**.

(i) Write the sample space.

$S = \{HH, HT, TH, TT\}$

(ii) Find the probability of getting two heads.

Favourable outcome = HH

Total outcomes = 4

$P(HH) = 1/4$

(iii) Find the probability of getting one head and one tail.

Favourable outcomes:

HT, TH

Therefore:

$$P = 2/4$$

$$= 1/2$$

The textbook gives the same four-outcome sample space for two coin tosses.

6. Die and Coin

A die is rolled and a coin is tossed.

(i) How many outcomes are possible?

Die $\rightarrow$ 6 outcomes

Coin $\rightarrow$ 2 outcomes

Total:

$$6 \times 2 = 12$$

(ii) What is the probability of getting an even number and heads?

Even die outcomes:

2, 4, 6

Favourable outcomes:

(2,H), (4,H), (6,H)

Therefore:

$$P = 3/12$$

$$= 1/4$$

 **Answer:**

(i) 12 outcomes

(ii) $1/4$

7. Probability Using a Die

A fair die is rolled once.

Find the probability of getting:

(i) A prime number

Prime numbers:

2, 3, 5

$$P = 3/6$$

$$= 1/2$$

(ii) A number greater than 4

Favourable:

5, 6

$$P = 2/6$$

$$= 1/3$$

(iii) A number less than 7

All six outcomes are favourable.

$$P = 6/6$$

$$= 1$$

8. Gambler's Fallacy

A fair coin has landed on heads **six times consecutively**.

What is the probability of getting tails on the next toss?

✅ **Answer:**

$\frac{1}{2}$

The previous six results do not affect the next toss.

Each toss is independent.

📌 **Important:** Thinking that tails has now become more likely is called the **Gambler's Fallacy**. The textbook specifically explains that a fair coin has no memory of previous tosses.

9. 🎲 Die – Three Consecutive Sixes ★

A fair die has shown **6 three times in a row**.

What is the probability of getting 6 on the next roll?

✅ **Answer:**

$\frac{1}{6}$

The previous results do not change the probability.

The textbook uses this exact idea to explain independent events and Gambler's Fallacy.

10. 🟠🟡 Balls Without Replacement

A bag contains:

- 🟠 4 red balls
- 🟡 3 green balls
- 🟢 2 blue balls

Two balls are drawn **without replacement**.

Find the probability that both balls are of different colours.

 Solution:

Total balls = 9.

Probability of same colour:

RR:

$$4/9 \times 3/8 = \mathbf{12/72}$$

GG:

$$3/9 \times 2/8 = \mathbf{6/72}$$

BB:

$$2/9 \times 1/8 = \mathbf{2/72}$$

Total same colour:

$$20/72$$

Therefore:

Different colours:

$$1 - 20/72$$

$$= 52/72$$

$$= \mathbf{13/18}$$

 Answer:

$$\mathbf{13/18}$$

This is one of the starred end-of-chapter probability problems.

11. Pair of Dice

A pair of fair 6-sided dice is thrown.

(i) Write an event having probability 0.

✓ **Answer:**

Getting a sum of **13**.

The maximum possible sum is 12.

Therefore:

$$P = 0$$

(ii) Give an outcome having probability 1.

✓ **Answer:**

Getting a sum **between 2 and 12 inclusive**.

Every possible dice throw has a sum in this range.

Therefore:

$$P = 1$$

The textbook asks this as a starred question.

12. **Two Dice – Prime Sum Greater Than 5**

Two dice are rolled.

Find the probability that their sum is a **prime number greater than 5**.

Prime sums greater than 5:

7 and 11

Ways to get 7:

6

Ways to get 11:

2

Total favourable outcomes:

8

Total outcomes:

36

Therefore:

$$P = 8/36$$

$$= 2/9$$

✓ **Answer:**

2/9

This is Question 12(i) in the textbook.

13. Three Coins

Three coins are tossed.

Find the probability that:

the first coin shows Heads and exactly two Heads occur in total.

 **Solution:**

Possible outcomes:

HHH, HHT, HTH, HTT, THH, THT, TTH, TTT

For the first coin to be H and total heads = 2:

HHT

HTH

Favourable outcomes = 2

Total = 8

Therefore:

$$P = 2/8$$

$$= 1/4$$

✓ **Answer:**

$$1/4$$

This is Question 12(iii) of the textbook.

14. **Four-Digit Number**

A four-digit number is formed using:

1, 2, 3, 4

without repetition.

Find the probability that the number is **even**.

 **Solution:**

Total numbers:

$$4! = 24$$

For an even number, the last digit must be:

2 or 4

2 choices for the last digit.

Remaining three digits can be arranged in:

$$3! = 6 \text{ ways.}$$

Favourable numbers:

$$2 \times 6 = 12$$

Therefore:

$$P = 12/24$$

$$= 1/2$$

✓ **Answer:**

$$1/2$$

15. Guessing MCQs

A student guesses answers to **3 MCQs**, each having 4 options, with only one correct answer.

Find the probability of getting **exactly 2 answers correct**.

 **Solution:**

Probability of correct answer:

$$1/4$$

Probability of incorrect answer:

$$3/4$$

Exactly 2 correct:

There are 3 possible positions for the incorrect answer.

Therefore:

$$P = 3 \times (1/4)^2 \times (3/4)$$

$$= 3 \times 1/16 \times 3/4$$

$$= 9/64$$

✓ **Answer:**

$$9/64$$

The textbook includes this as Question 12(v).



16. Tree Diagram – With Replacement



A box contains **4 balls numbered 1, 2, 3 and 4**.

A ball is drawn, its number recorded, **replaced**, and a second ball is drawn.

(i) Number of outcomes

First draw = 4 possibilities

Second draw = 4 possibilities

Total:

$$4 \times 4 = 16$$

Sample space:

{11, 12, 13, 14,
21, 22, 23, 24,
31, 32, 33, 34,
41, 42, 43, 44}



Answer:

16 outcomes

The textbook specifically asks students to represent this using a tree diagram.



17. Tree Diagram – Without Replacement

The same box contains balls numbered **1, 2, 3 and 4**.

A ball is drawn and **not replaced**, then a second ball is drawn.

Sample space:

{12, 13, 14,
21, 23, 24,
31, 32, 34,
41, 42, 43}

Number of outcomes:

$$4 \times 3 = 12$$

✓ **Answer:**

12 outcomes

18. Coin and Card

A coin is tossed simultaneously with drawing one card from cards numbered:

1, 2, 3, 4, 5, 6

Sample space:

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

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

✓ **Answer:**

12 outcomes

The textbook asks for this sample space explicitly.

19. Number of Heads

Three coins are tossed and **only the number of heads** is recorded.

Possible numbers of heads are:

0, 1, 2, 3

✓ Sample Space:

$$S = \{0, 1, 2, 3\}$$

Why?

- 0 heads $\rightarrow$ TTT
- 1 head $\rightarrow$ HTT, THT, TTH
- 2 heads $\rightarrow$ HHT, HTH, THH
- 3 heads $\rightarrow$ HHH

📌 The important point is that the experiment records **number of heads**, not the individual H/T sequences. The textbook asks students to identify which proposed list qualifies as a sample space and explain why other lists fail.



COMPLETE ANSWER KEY

Q.	Answer
1(i)	0
1(ii)	1
1(iii)	0 to 1
1(iv)	1/2
2	Certain / Impossible / Equally likely etc.
3(i)	{H,T}
3(ii)	{1,2,3,4,5,6}
3(iii)	{-5,...,5}
3(iv)	{Green, Red}
4(i)	6 snack-drink outcomes
4(ii)	2 Samosa outcomes
5(ii)	1/4
5(iii)	1/2

6(i) 12 outcomes

6(ii) $1/4$

7(i) $1/2$

7(ii) $1/3$

7(iii) 1

8 $1/2$

9 $1/6$

10 $13/18$

11(i) 0

11(ii) 1

12(i) $2/9$

12(ii) $13/18$

12(iii) $1/4$

12(iv) $1/2$

12(v) $9/64$

13(i) 16 outcomes

13(ii) 12 outcomes

14 12 outcomes

15 $\{0,1,2,3\}$

★ Highest-Priority Questions

For your **Chapter 7 Important Questions** resource, I would mark these as ★ **Must Do**:

★ Gambler's Fallacy

★ Two-dice probability

★ Balls without replacement

★ Three-coin probability

- ★ Four-digit number probability
- ★ MCQ guessing probability
- ★ Tree diagrams with replacement
- ★ Tree diagrams without replacement
- ★ Identifying a correct sample space
- ★ Probability of impossible/certain events

These starred questions are explicitly marked for deeper reasoning in the textbook.