PROBABILITY

MCQs & A and R WORK SHEET

Test / Exam Name: Probability	**Standard: 10th**	**Subject: Mathematics**
Student Name:	**Section:**	**Roll No.:**

Questions: 48	Time: 01:00 hh:mm	Negative Marks: 0	Marks: 48

Instructions

1. MULTIPLE CHOICE QUESTIONS.

Q1. Choose the correct answer from the given four options: **1 Mark**

If P(A) denotes the probability of an event A, then:

A $P(A) < 0$ **B** $P(A) > 1$ **C** $0 \leq P(A) \leq 1$ **D** $-1 \leq P(A) \leq 1$

Ans: C $0 \leq P(A) \leq 1$

Solution:

Since, probability of an event always lies between 0 and 1.

Q2. Which of the following can not be the probability an event? **1 Mark**

A 1.5 **B** $\frac{3}{5}$ **C** 25% **D** 0.3

Ans: A 1.5

Solution:

$0 \leq$ Probability of event E ≤ 1

Probability of an event (E) is always greater than or equal to 0. Also, it is always less than or equal to one.

This implies that the probability of an event cannot be negative or greater than 1.

Therefore, out of these alternatives, 1.5 cannot be a probability of an event.

Hence, (A).

Q3. The probability of an impossible event is: **1 Mark**

A 1 **B** 100 **C** Zero **D** 0.01

Ans: C Zero

Solution:

An event which has no chance of occurrence is called an impossible event.

for example: The probability of getting more than 6 when a die is thrown is an impossible event because the highest number in a die is 6

The probability of an impossible event is always zero.

Q4. The probability of a certain event is: **1 Mark**

A 0 **B** 1 **C** $\frac{1}{2}$ **D** No existent.

Ans: B 1

Solution:

Given: 4 options of probability of some events

To Find: Which of the given options is the probability of sure event?

We know that, probability of a certain event is 1.

Hence the correct answer is option b.

Q5. Choose the correct answer from the given four options: **1 Mark**

If an event cannot occur, then its probability is:

A 1 **B** $\frac{3}{4}$ **C** $\frac{1}{2}$ **D** 0

Ans: D 0

Solution:

The event which cannot occur is said to be impossible event and probaility of impossible event is zero.

Q6. The probability that a non leap year will have 53 Fridays and 53 Saturdays is: **1 Mark**

A $\frac{3}{7}$ **B** 0 **C** $\frac{2}{7}$ **D** $\frac{1}{7}$

Ans: B 0

Solution:

Non-leap year contains 366 days = 52 weeks + 1 day

52 weeks contain 52 Fridays and 52 weeks contain 52 Saturdays

We will get 53 Fridays or 53 Saturdays if remaining one day is a Friday and Saturday

Therefore, Total possibility is zero.

Number of Total possible outcomes = 7

Number of possible outcomes Friday and Saturday = 0

Required Probability $= \frac{0}{7} = 0$

Q7. The probability that a non leap year selected at random will have 53 Sundays is: **1 Mark**

A $\frac{4}{7}$ **B** $\frac{3}{7}$ **C** $\frac{1}{7}$ **D** $\frac{2}{7}$

Ans: C $\frac{1}{7}$

Solution:

Non-leap year contains 365 days = 364 days + 1 day $= \left(\frac{364}{7}\right)$ weeks + 1 day = 52 weeks + 1 remaining day = 52 Sundays + 1 remaining day

We will have 53 Sundays if 1 remaining day is a Sunday.

Possible outcomes = {(Monday), (Tuesday), (Wednesday), (Thursday), (Friday), (Saturday), (Sunday)}

Number of Total outcomes = 7

Number of possible outcomes = 1

∴ Required probability $= \frac{\text{Possible outcomes}}{\text{Total outcomes}} = \frac{1}{7}$

Q8. The probability that it will rain on a particular day is 0.76. The probability that it will not rain on that day is: **1 Mark**

A 0.76 **B** 1 **C** 0 **D** 0.24

Ans: D 0.24

Solution:

Given: P (It will rain on a particular day) = 0.76

∴ P (It will not rain on a particular day) = 1 - P (It will rain particular day)

= 1 - 0.76 = 0.24

Q9. There are 20 boys and 15 girls in a class. A student is chosen as leader at random. The probability that the leader is a boy is: **1 Mark**

A $\frac{3}{7}$ **B** $\frac{4}{7}$ **C** 20 **D** 15

Ans: B $\frac{4}{7}$

Solution:

Number of boys = 20

Number of possible outcomes = 20

Number of Total outcomes = 20 + 15 = 35

∴ Required Probability $= \frac{20}{35} = \frac{4}{7}$

Q10. Choose the correct answer from the given four options: **1 Mark**

A girl calculates that the probability of her winning the first prize in a lottery is 0.08. If 6000 tickets are sold, how many tickets has she bought?

A 40 **B** 240 **C** 480 **D** 750

Ans: B 240

Solution:

Given, total number of sold tickets = 6000

Let she bought x tickets.

Then, probability of her winning the first prize $= \frac{x}{6000} = 0.08$

⇒ x = 0.08 × 6000

∴ x = 480

Hence, she bought 480 tickets.

Q11. The probability that a number selected at random from the numbers 1, 2, 3, ..., 15 is a multiple of 4 is: **1 Mark**

A $\frac{4}{15}$ **B** $\frac{2}{15}$ **C** $\frac{1}{5}$ **D** $\frac{1}{3}$

Ans: C $\frac{1}{5}$

Solution:

The selected numbers would be 4, 8, and 12.

So, there are 3 number.

P(number of multiples of 4)

$= \frac{\text{Number of multiples of 4}}{\text{Total}}$

$= \frac{3}{15}$

$= \frac{1}{5}$

Q12. A number x is chosen at random from the numbers -3, -2, -1, 0, 1, 2, 3 the probability that $|x| < 2$ is:　　　　**1 Mark**

A $\frac{5}{7}$　　　　　　**B** $\frac{2}{7}$　　　　　　**C** $\frac{3}{7}$　　　　　　**D** $\frac{1}{7}$

Ans: C $\frac{3}{7}$

Solution:

Total possible number of events (n) = 7

Now $|x| < 2$

x < 2 or -x < 2 ? x > -2

$\therefore$ x

? x = 1, 0, -1, -2, -3 or x = -1, 0, 1, 2, 3

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

$\therefore$ m = 3

$\therefore$ Probability $= \frac{m}{n} = \frac{3}{7}$

Q13. 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:　　　　**1 Mark**

A $\frac{1}{10}$　　　　　　**B** $\frac{3}{10}$　　　　　　**C** $\frac{7}{10}$　　　　　　**D** $\frac{9}{10}$

Ans: C $\frac{7}{10}$

Solution:

Total numbers are $\sum x_i = 10$

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

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 $= 7$

$\therefore$ Probability of average number $= \frac{7}{10}$

Q14. The probability of getting 3 head or 3 tails in tossing a coin 3 times is:　　　　**1 Mark**

A $\frac{1}{2}$　　　　　　**B** $\frac{1}{4}$　　　　　　**C** $\frac{1}{8}$　　　　　　**D** $\frac{3}{8}$

Ans: B $\frac{1}{4}$

Solution:

Total outcomes = {HHH, HHT, HTH, HTT, THH, THT, TTH, TTT} = 8

Number of possible outcomes = (HHH) or (TTT) = 2

Required Probability $= \frac{2}{8} = \frac{1}{4}$

Q15. Two coins are tossed simultaneously. What is the probability of getting at most one head?　　　　**1 Mark**

A $\frac{1}{4}$　　　　　　**B** $\frac{1}{2}$　　　　　　**C** $\frac{2}{3}$　　　　　　**D** $\frac{3}{4}$

Ans: D $\frac{3}{4}$

Solution:

When two coins are tossed the simultanecusly the

outcomes are:

{HH, HT, TH, TT}

So, there are 4 outcomes.

Getting atmost one head means the possible outcomes are:

{HT, TH, TT}

So, there are 3 possible outcomes.

P(getting atmost one head)

$= \frac{3}{4}$

Q16. Three coins are tossed simultaneously. What is the probability of getting exactly two heads? **1 Mark**

A $\frac{1}{2}$ **B** $\frac{1}{4}$ **C** $\frac{3}{8}$ **D** $\frac{3}{4}$

Ans: **C** $\frac{3}{8}$

Solution:

When three coins are tossed the simultaneously the

outcomes are:

{HHH, HHT, HTH, THT, HTT, TTH and TTT}

So, there are 8 possible outcones.

P(getting exactly two heads)

$= \frac{3}{8}$

Q17. The probability of throwing a number greater than 2 with a fair dice is: **1 Mark**

A $\frac{3}{5}$ **B** $\frac{2}{5}$ **C** $\frac{2}{3}$ **D** $\frac{1}{3}$

Ans: **C** $\frac{2}{3}$

Solution:

Given: A dice is thrown once

To Find: Probability of getting a number greater than 2.

Total number on a dice is 6.

Number greater than 2 is 3, 4, 5 and 6

Total number greater than 2 is 4

We know that Probability $= \frac{\text{Number of favourable event}}{\text{Total number of event}}$

Hence probability of getting a number greater than 2 is equal to $\frac{4}{6} = \frac{2}{3}$

Hence the correct option is c.

Q18.A die is thrown once. The probability of getting a prime number is: **1 Mark**

A $\frac{2}{3}$ **B** $\frac{1}{3}$ **C** $\frac{1}{2}$ **D** $\frac{1}{6}$

Ans: **C** $\frac{1}{2}$

Solution:

The number on a die are 1, 2, 3, 4, 5 and 6.

So, there are 6 numbers in total.

The prime numbers on the die are 2, 3, and 5.

So, there are 3 numbers.

P(getting a prime number on the die)

$= \frac{3}{6}$

$= \frac{1}{2}$

Q19. The probability of getting an even number, when a die is thrown once, is: **1 Mark**

A $\frac{1}{2}$ **B** $\frac{1}{3}$ **C** $\frac{1}{6}$ **D** $\frac{5}{6}$

Ans: **A** $\frac{1}{2}$

S = {1, 2, 3, 4, 5, 6} there are 6 possibilities in our set, each number has a probability of $\frac{1}{6}$

S even = {2, 4, 6}

There are three sets of possibilities

Probability $= \frac{\text{event set}}{\text{total set}}$

Probability even $= \frac{3}{6} = \frac{1}{2}$

Q20. From a well shuffled pack of 52 cards, one card is drawn at random. The probability of getting a diamond is: **1 Mark**

A $\frac{12}{52}$ **B** $\frac{1}{4}$ **C** $\frac{3}{4}$ **D** $\frac{1}{2}$

Ans: **B** $\frac{1}{4}$

Solution:

The probability of drawing a diamond-faced card from a pack of 52 playing cards is easy to determine. Since there are 13

diamond-faced cards in the deck, the probability becomes $\frac{13}{52} = \frac{1}{4}$

Q21.A card is drawn from a well-shuffled deck of 52 playing cards. The probability that the card will not be an ace **1 Mark**

is:

A $\frac{1}{13}$ **B** $\frac{1}{4}$ **C** $\frac{12}{13}$ **D** $\frac{3}{4}$

Ans: C $\frac{12}{13}$

Solution:

Total number of cards = 52

Number of non-aces = 52 – 4 = 48

Probability $= \frac{48}{52} = \frac{12}{13}$

Q22. The king, queen and jack of clubs are removed from a deck of 52 cards and the remaining cards are shuffled. A card is drawn from the remaining cards. The probability of getting a king is: **1 Mark**

A $\frac{3}{49}$ B $\frac{3}{52}$ C $\frac{4}{49}$ D $\frac{4}{52}$

Ans: A $\frac{3}{49}$

Solution:

K, Q, J of clubs i.e 3 cards are removed, therefore remaining cards = 52 - 3 = 49

3 kings are left in the pack

Number of possible outcomes = 3

Number of total outcomes = 52 - 3 = 49

∴ Required Probability $= \frac{3}{49}$

Q23. Cards bearing numbers 2, 3, 4, ..., 11 are kept in a bag. A card is drawn at random from the bag. The probability of getting a card with a prime number is: **1 Mark**

A $\frac{1}{2}$ B $\frac{2}{5}$ C $\frac{3}{10}$ D $\frac{5}{9}$

Ans: A $\frac{1}{2}$

S = {2, 3, 4, 5, 6, 7, 8, 9, 10, 11}

∴ **Total number of outcomes = 10**

Let A be the event of drawing a card with a prime number.

The cards with prime number are 2, 3, 5, 7 and 11.

Number of outcomes in favour of event A = 5

∴ **Requried probability P(A)**

$= \frac{\text{Number of outcomes in favour of A}}{\text{Total number of outcomes i}}$

$= \frac{5}{10}$

$= \frac{1}{2}$

Q24. A card is drawn from a pack of 52 cards at random. The probability of getting neither an ace nor a king card is: **1 Mark**

A $\frac{4}{13}$ B $\frac{11}{13}$ C $\frac{2}{13}$ D $\frac{8}{13}$

Ans: B $\frac{11}{13}$

Solution:

Number of Total outcomes = 52

Number of aces and Number of kings = 4 + 4 = 8

Number of cards except ace and king = 52 - 8 = 44

Required Probability $= \frac{44}{52} = \frac{11}{12}$

Q25. The probability that a leap year selected at random will have 53 Fridays is: **1 Mark**

A $\frac{2}{7}$ B $\frac{6}{7}$ C $\frac{4}{7}$ D $\frac{1}{7}$

Ans: A $\frac{2}{7}$

Solution:

Leap year contains 366 days = 364 days + 2 days = 364/73 weeks + 2 additional days = 52 weeks + 2 additional days

52 weeks contain 52 Fridays

We will get 53 Fridays if one of the remaining two additional days is a Friday

These additional days can be :

{(Sunday, Monday), (Monday, Tuesday), (Tuesday, Wednesday), (Wednesday, Thursday), (Thursday, Friday), (Friday, Saturday), (Saturday, Sunday)}

Number of total outcomes = 7

Number of possible outcomes = 2

∴ Required Probabillity of the event $= \frac{\text{Number of possible outcomes}}{\text{Number of total outcomes}} = \frac{2}{7}$

Q26. **1 Mark**

A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball, then the number of blue balls is:

A 10   **B** 12   **C** 5   **D** 8

Ans: **A** 10

Solution:

Let the number of blue balls be x.

∴ Number of total outcomes = 5 + x

Now, P (getting the red ball) $= \frac{5}{5+x}$

∴ P (getting the blue ball) $= 2\left(\frac{5}{5+x}\right)$

Also P (getting the blue ball) $= \frac{x}{x+5}$

∴ $2\left(\frac{5}{x+5}\right) = \frac{x}{x+5}$

$\Rightarrow x = 10$

Q27. A bag contains 3 white, 4 red and 5 black balls. One ball is drawn at random. What is the probability that the ball drawn is neither black nor white?   **1 Mark**

A $\frac{1}{4}$ **B** $\frac{1}{2}$ **C** $\frac{1}{3}$ **D** $\frac{3}{4}$

Ans: **C** $\frac{1}{3}$

Solution:

The bag contains 3 white, 4 red and 5 black and balls.

So, the total number of balls = 3 + 4 + 5 = 12

For the ball that is drawn to be neither black not white, it should be red.

The number of red balls = 4

P(getting a red ball)

$= \frac{4}{12}$

$= \frac{1}{3}$

Q28. Two dice are thrown together. The probabililty of getting the same number on both dice is: **1 Mark**

A $\frac{1}{2}$ **B** $\frac{1}{3}$ **C** $\frac{1}{6}$ **D** $\frac{1}{12}$

Ans: **C** $\frac{1}{6}$

Solution:

The number on each die are 1, 2, 3, 4, 5 and 6.

So, the total possibilities 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)

So, there are 36 number in toral.

There are 6 possibilities when the two die

have the same number (1, 1), (2, 2), (3, 3), (4, 4), (5, 5), (6, 6).

P(getting the same number on both the die)

$= \frac{6}{36}$

$= \frac{1}{6}$

Q29. 3 rotten eggs are mixed with 12 good ones. One egg is chosen at random. The probability of choosing a rotten egg is: **1 Mark**

A $\frac{1}{5}$ **B** $\frac{1}{15}$ **C** $\frac{2}{5}$ **D** $\frac{4}{5}$

Ans: **A** $\frac{1}{5}$

Solution:

Number of possible outcomes = 3

Number of Total outcomes = 15

∴ Required Probability $= \frac{3}{15} = \frac{1}{5}$

Q30. There are 8 defective items in a sample of 24 items. One item is drawn at random. The probability that it is a non-defective item is: **1 Mark**

A 1   **B** $\frac{2}{4}$ **C** $\frac{1}{2}$ **D** $\frac{1}{3}$

Ans: B $\frac{2}{4}$

Solution:

Number of Non-defective items = 24 - 8 = 16

Number of possible outcomes = 16

Number of Total outcomes = 24

Probability of getting a Non-defective item $= \frac{16}{24} = \frac{2}{3}$

Q31. Ram and Shyam are friends. The probability that both will have the birthday on the same day is: **1 Mark**

A $\frac{2}{365}$ **B** $\frac{4}{365}$ **C** $\frac{1}{365}$ **D** $\frac{364}{365}$

Ans: C $\frac{1}{365}$

Solution:

Assuming a non-leap year

Ram can have the birthday on any day of the 365 days of the year

Shyam has a different birthday if his birthday is on any of the remaining 364 days of the year

Therefore P (Ram and Shyam have different birthdays) $= \frac{364}{365}$

and so, P (Ram and Shyam have birthdays on the same day) = 1 - P(Ram and Shyam have different birthdays)

$= 1 - \frac{364}{365}$

$= \frac{1}{365}$

Q32. Choose the correct answer from the given four options: **1 Mark**

A school has five houses A, B, C, D and E. A class has 23 students, 4 from house A, 8 from house B, 5 from house C, 2 from house D and rest from house E. A single student is selected at random to be the class monitor. The probability that the selected student is not from A, B and C is:

A $\frac{4}{23}$ **B** $\frac{6}{23}$ **C** $\frac{8}{23}$ **D** $\frac{17}{23}$

Ans: B $\frac{6}{23}$

2. $\frac{6}{23}$

Solution:

Total Number of students = 23

Number of students in house A, B and C = 4 + 8 + 5 = 17

∴ Remains students = 23 - 17 = 6

So, probability that the selected student is not from A, B and C $= \frac{6}{23}$

Q33. In a lottery, there are 6 prizes and 24 blanks. What is the probability of not getting a prize?   **1 Mark**

A $\frac{3}{4}$ **B** $\frac{3}{5}$ **C** $\frac{4}{5}$ **D** None of these

Ans: C $\frac{4}{5}$

Solution:

The number of prizes = 6

The number of blanks = 24

So, the total number of tickets = 6 + 24 = 30

P(not getting a prize)

$= \frac{24}{30}$

$= \frac{4}{5}$

Q34. An unbiased die is thrown once. The probability of getting a prime or composite number is: **1 Mark**

A $\frac{1}{2}$ **B** $\frac{5}{6}$ **C** $\frac{1}{6}$ **D** 1

Ans: B $\frac{5}{6}$

Solution:

prime numbers on a die are 2, 3, 5

composite numbers on a die are 4, 6

Prime and Composite numbers on a die = 2, 3, 4, 5, 6

Number of possible outcomes = 5

Number of Total outcomes = 6

Required Probability

Q35. In a family of 3 children, the probability of having at least one boy is: **1 Mark**

     A $\frac{7}{8}$ **B** $\frac{1}{8}$ **C** $\frac{5}{8}$ **D** $\frac{3}{4}$

Ans: **A** $\frac{7}{8}$

Solution:

The probability that each child will be a boy is $\frac{1}{2}$.

The probability that each child will be a girl is $\frac{1}{2}$.

The probability of no boys $= \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}$

The probability of at least 1 boy = 1 - The probability of no boys.

$= 1 - \frac{1}{8} = \frac{7}{8}$

Q36. What is the probability that a leap year has 52 Mondays? **1 Mark**

     A $\frac{2}{7}$ **B** $\frac{4}{7}$ **C** $\frac{5}{7}$ **D** $\frac{6}{7}$

Ans: **C** $\frac{5}{7}$

Solution:

Given: A leap year

To Find: Probability that a leap year has 52 Mondays.

Total number of days in leap year is 366 days

Hence number of weeks in a leap year is $\frac{366}{7} = 52$ weeks and 2 day

In a leap year we have 52 complete weeks and 2 day which can be any pair of the day of the week i.e.

(Sunday, Monday)

(Monday, Tuesday)

(Tuesday, Wednesday)

(Wednesday, Thursday)

(Thursday, Friday)

(Friday, Saturday)

(Saturday, Sunday)

To make 52 Mondays the additional days should not include Monday

Hence total number of pairs of days is 7

Favorable day i.e. in which Mondays is not there is 5

We know that Probability $= \frac{\text{Number of favourable event}}{\text{Total number of event}}$

Hence probability that a leap year has 52 Mondays is equal to $\frac{5}{7}$

Hence the correct option is c.

Q37. A letter is chosen at random from the word ACCOMMODATION. The probability that it is A or O is: **1 Mark**

     A $\frac{5}{13}$ **B** $\frac{8}{13}$ **C** $\frac{6}{13}$ **D** $\frac{10}{13}$

Ans: **A** $\frac{5}{13}$

Solution:

Number of possible outcomes = {A, O, O, A O} = 5

Number of Total outcomes = 13

Required Probability $= \frac{5}{13}$

Q38. A month is selected at random in a year. The probability that it is March or October, is: **1 Mark**

     A $\frac{1}{12}$ **B** $\frac{1}{6}$ **C** $\frac{3}{4}$ **D** None of these.

Ans: **B** $\frac{1}{6}$

Solution:

No. of months in a year = 12

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

$= \frac{1}{6}$

Q39. There are 5 balls are Blue balls, 7 Red balls and some White balls in a bag. If one ball is drawn from the bag at random, the probability of getting a white ball is $\frac{1}{5}$. What is the probability that the ball would be Blue? **1 Mark**

     A $P(Blue) = \frac{7}{12}$ **B** $P(Blue) = \frac{5}{12}$ **C** $P(Blue) = \frac{1}{3}$ **D** $P(Blue) = \frac{1}{15}$

Ans: C. $P(Blue) = \frac{1}{3}$

Let the number of white balls be 'x'

Total number of balls $= 5 + 7 + x = 12 + x$

Given,

$P(White) = \frac{1}{5}$

$implies \frac{x}{(12+x)} = \frac{1}{5}$

$implies x = 3$

Total Number of balls $= 12 + x = 12 + 3 = 15$

$P(Blue) = \frac{5}{15} = \frac{1}{3}$

Q40.Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason   **1 Mark**
(R).Mark the correct choice as:

    Assertion: The probability of winning a game is 0.4, then the probability of losing it, is 0.6.

    Reason: P(E) + P(not E) = 1.

A If both Assertion and Reason are true and Reason is the correct explanation of
Assertion.

B If both Assertion and Reason are true and Reason is not the correct explanation of
Assertion.

C If Assertion is true but Reason is false.   **D** If Assertion is false but Reason is true.

Ans: A If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

Solution:

We have, P(E) = 04

where E = event of winning

P(Not EZ) = 1 - P(E) = 1 - 04 = 06

Q41.Assertion: Card numbered as 1, 2, 3 bevees 15 are put in a box and mixed throughly, one card is then drawn   **1 Mark**
at random.The probability of drawing an even number is a

    Reason: For any event E, we have $O \leq P(E) \leq 1$.

A If both Assertion and Reason are true and Reason is the correct explanation of
Assertion.

B If both Assertion and Reason are true and Reason is not the correct explanation of
Assertion.

C If Assertion is true but Reason is false.   **D** If Assertion is false but Reason is true.

Ans: D If Assertion is false but Reason is true.

4. If Assertion is false but Reason is true.

Q42.Assertion: If a die is thrown, the probability of getting a number less than 3 and greater than 2 is zero.   **1 Mark**

    Reason: Probability of an impossible event is zero.

A If both Assertion and Reason are true and Reason is the correct explanation of
Assertion.

B If both Assertion and Reason are true and Reason is not the correct explanation of
Assertion.

C If Assertion is true but Reason is false.   **D** If Assertion is false but Reason is true.

Ans: A If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

Solution:

Now, where dice is thrown the possible outcomes are (1, 2, 3, 4, 5, 6), Now, if you see the outcomes getting a number
greater than "2" and less than "3" is impossible.

∴ Probability is zero

The probability of an impossible event

= 0

Q43.Assertion: When two coins are tossed simultaneously then the probability of getting no tail is $\frac{1}{4}$ **1 Mark**

    Reason: The probability of getting a head (i.e., no tail) in one toss of a coin is $\frac{1}{2}$

A If both Assertion and Reason are true and Reason is the correct explanation of
Assertion.

B If both Assertion and Reason are true and Reason is not the correct explanation of
Assertion.

C If Assertion is true but Reason is false.   **D** If Assertion is false but Reason is true.

Ans: B If both Assertion and Reason are true and Reason is not the correct explanation of Assertion.

Solution:

Probability of both head

$= \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

Q44.Assertion: If a die is thrown, the probability of getting a number less than 3 and greater than 2 is zero. **1 Mark**

    Reason: Probability of an impossible event is zero.

  A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

  B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

  C Assertion (A) is true but reason (R) is false.   **D** Assertion (A) is false but reason (R) is true.

Ans: A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

1. Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Q45.Assertion: In a simultaneously throw a pair of dice.The probability of getting a double is $\frac{1}{6}$ **1 Mark**

    Reason: Probability of an event may be negative.

  A If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

  B If both Assertion and Reason are true and Reason is not the correct explanation of Assertion.

  C If Assertion is true but Reason is false.   **D** If Assertion is false but Reason is true.

Ans: C If Assertion is true but Reason is false.

Solution:

When two dice are tossed.

Total possible outcomes = 36

n(S) = 36

and total favourable outcomes (doublet)

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

n(E) = 6

$\therefore$ Probability $= \frac{6}{36} = \frac{1}{6}$ and

We know that, $0 \leq P(E) \leq 1$

Q46.Assertion: If the probability of an event is P, then probability of its complementary event will be 1 - P. **1 Mark**

    Reason: When E and $\overline{E}$ are complementary events, then $P(E) + P\overline{E} = 1$

  A If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

  B If both Assertion and Reason are true and Reason is not the correct explanation of Assertion.

  C If Assertion is true but Reason is false.   **D** If Assertion is false but Reason is true.

Ans: A If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

Solution:

The probability of an event to be unlikely if the probability is near to '0'. As 0.0001 is near to 0, the occuring of event is unlikely.

Now, we know probability of an event lies in between 0 and 1 because total possibilities will be always greater than equal to favourable outcomes.

Q47.Assertion: When two coins are tossed simultaneously then the probability of getting no tail is $\frac{1}{4}$ **1 Mark**

    Reason: The probability of getting a head (ie., no +7) tail) in one toss of a coin is $\frac{1}{2}$

  A Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

  B Both Assertion and Reason are true and Reason is not the correct explanation of Assertion.

  C Assertion is true but Reason is false.   **D** Assertion is false but Reason is true.

Ans: A Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

Solution:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Probability of getting no tail when two coins tossed simultaneously i.e., both are head.

Probability ili of both head $= \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

Q48.Assertion: The probability of getting a prime number, When a die is throw n once is $\frac{2}{3}$ **1 Mark**

    Reason: Prime numbers on a die are 2, 3, 5.

  A If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

B If both Assertion and Reason are true and Reason is not the correct explanation of Assertion.

C If Assertion is true but Reason is false.   **D** If Assertion is false but Reason is true.

Ans: D If Assertion is false but Reason is true.

Solution:

When a die is thrown once, total possible outcomes = 6

and prime numbers in it are (2, 3, 5)

Total favourable outcomes = 3

Probability of getting a prime $= \frac{3}{6} = \frac{1}{2}$