

## Probability

### Key Points

- The Theoretical probability of an event E written as  $P(E)$ , is defined as.  

$$P(E) = \frac{\text{Number of outcomes favourable to E}}{\text{Number of all possible outcomes of the experiment}}$$

Where the outcomes of the experiment are equally likely.
- The sum of the probability of all the elementary events of an experiment is 1.
- The probability of a sure event is 1 and probability of an impossible event is 0.
- $P(E) + P(\bar{E}) = 1$ .
- The probability of an event E is a number  $P(E)$  such that  $0 \leq P(E) \leq 1$ .
- A pack of cards consists of 52 cards which are divided into 4 suits of 13 cards each  
 spades , hearts , diamonds  and clubs . Clubs and spades are of black colour, while hearts and diamonds are of red colour.
- The cards in each suit are ace, king, queen, jack, 10, 9, 8, 7, 6, 5, 4, 3 and 2.
- Kings, queens and jacks are called face cards. Thus there are 12 face cards in a deck of cards.

### VERY SHORT ANSWER QUESTIONS

- Find the probability of getting one head if a coin is thrown twice.
- One card is drawn at random from a pack of cards. Find the probability of getting jack.
- One card is drawn at random from a pack of cards. Find the probability of getting a diamond card.
- A die is thrown once. What is the probability of getting an even prime number?
- A die is thrown twice. What is the probability that the same number will come up either time?

6. In a leap year what is the probability of 53 Sundays.
7. One card is drawn from the well shuffled pack of 52 cards. Find the probability of getting a black face card.
8. If the probability of occurrence of an event is 27%, then what is the probability of not occurrence of event P?
9. Usha and Aastha are two friends. What is the probability that their birthday falls on the same day 14 November 2015?
10. One alphabet is chosen out of the alphabets of the word "BHARTIYA". What will be the probability of getting a vowel?
11. Two friends were born in the year 2000. What is the probability that they both have the same birthday.
12. A die is thrown once. What is the probability of getting a prime number?
13. A bag contains 6 red and 5 blue balls. One ball is drawn at random from the bag. Find the probability that the ball drawn is blue.
14. A pair of dice is thrown once. What is the probability of getting the sum on both the die as 11.
15. In a non - leap year, what is the probability of 53 Mondays?

#### **VERY SHORT ANSWER QUESTIONS**

16. A card is drawn at random from a pack of 52 playing cards. Find the probability that the card drawn is neither an ace nor a king.
17. Out of 250 bulbs in a box, 35 bulbs are defective. One bulb is taken out at random from the box. Find the probability that the drawn bulb is not defective.
18. Non Occurance of any event is 3:4. What is the probability of Occurance of this event?
19. If 29 is removed from (1, 4, 9, 16, 25, 29) then find the probability of getting a prime number.
20. A card is drawn at random from a deck of playing cards. Find the probability of getting a face card.
21. In 1000 lottery tickets there are 5 prize winning tickets. Find the probability of winning a prize if a person buys one ticket.
22. One card is drawn at random from a pack of cards. Find the probability that it is a black card.

23. A die is thrown once. Find the probability of getting a perfect square.
24. Two dice are rolled simultaneously. Find the probability that the sum of the two numbers appearing on the top is more than and equal to 10.
25. Find the probability of multiples of 7 in 1, 2, 3, .....,33, 34, 35.

### Long Answer Type Questions

26. Cards marked with numbers 3, 4, 5, .....,50 are placed in a box and mixed thoroughly. One card is drawn at random from the box, find the probability that the number on the drawn card is
  - (i) divisible by 7
  - (ii) a number, which is a perfect square
27. A bag contains 5 white balls, 7 red balls, 4 black balls and 2 blue balls. One ball is drawn at random from the bag. Find the probability that the balls drawn is
  - (i) White or blue
  - (ii) red or black
  - (iii) not white
  - (iv) neither white nor black
28. The king, queen and jack of diamonds are removed from a pack of 52 playing cards and the pack is well shuffled. A card is drawn from the remaining cards. Find the probability of getting a card of
  - (i) diamond
  - (ii) a jack
29. The probability of winning a game is  $\frac{x}{12}$ . The probability of losing it is  $\frac{1}{3}$ . Find the value of  $x$ .
30. In a lottery, there are 10 prizes and 25 are empty. Find the probability of getting a prize. Also verify that.  $P(E) + P(\bar{E}) = 1$  for this event
31. The probability of a defective egg in a lot of 400 eggs is 0.035. Calculate the number of defective eggs in the lot. Also calculate the probability of taking out a non defective egg from the lot.
32. In a fair at a game stall, slips marked with numbers 3,3,5,7,7,7,9,9,11 are placed in a box. A person wins if the mean of numbers are written on the slip. What is the probability of his losing the game?
33. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears
  - (i) a two digit number
  - (ii) a perfect square number
  - (iii) a number divisible by 5.

34. A card is drawn at random from a well shuffled deck of playing cards. Find the probability that the card drawn is
- (i) a card of spade or an ace
  - (ii) a red king
  - (iii) neither a king nor a queen
  - (iv) either a king or a queen
35. A card is drawn from a well shuffled deck of playing cards. Find the probability that the card drawn is
- (i) a face card
  - (ii) red colour face card
  - (iii) black colour face card
36. Ramesh got Rs. 24000 as Bonus. He donated Rs. 5000 to temple. He gave Rs. 12000 to his wife, Rs. 2000 to his servant and gave rest of the amount to his daughter. Calculate the probability of
- (i) wife's share
  - (ii) Servant's Share
  - (iii) daughter's share.
37. 240 students reside in a hostel. Out of which 50% go for the yoga classes early in the morning, 25% go for the Gym club and 15% of them go for the morning walk. Rest of the students have joined the laughing club. What is the probability of students who have joined laughing club?

## ANSWERS

1.  $\frac{1}{2}$

2.  $\frac{1}{13}$

3.  $\frac{1}{4}$

4.  $\frac{1}{6}$

5.  $\frac{1}{6}$

6.  $\frac{2}{7}$

7.  $\frac{3}{26}$

8.  $\frac{73}{100}$  or 73%

9.  $\frac{1}{365}$

10.  $\frac{3}{8}$

11.  $\frac{1}{366}$

12.  $\frac{1}{2}$

13.  $\frac{5}{11}$

14.  $\frac{1}{18}$

15.  $\frac{1}{7}$

16.  $\frac{11}{13}$

17.  $\frac{43}{50}$

18.  $\frac{4}{7}$

19. 0

20.  $\frac{3}{13}$

21. 0.005

22.  $\frac{1}{2}$

23.  $\frac{1}{3}$

24.  $\frac{1}{6}$

25.  $\frac{1}{7}$

26.  $\frac{7}{16}, \frac{1}{4}$

$$27. \frac{7}{18}, \frac{11}{18}, \frac{13}{18}, \frac{1}{2}$$

$$28. \frac{10}{49}, \frac{3}{49}$$

$$29. 8$$

$$30. \frac{2}{7}$$

$$31. 14, 0.965$$

$$32. \frac{7}{10}$$

$$33. \frac{9}{10}, \frac{1}{10}, \frac{1}{5}$$

$$34. (i) \frac{4}{13} \quad (ii) \frac{1}{26} \quad (iii) \frac{11}{13} \quad (iv) \frac{2}{13}$$

$$35. (i) \frac{3}{13} \quad (ii) \frac{3}{26} \quad (iii) \frac{3}{26}$$

$$36. (i) \frac{1}{2} \quad (ii) \frac{1}{12} \quad (iii) \frac{5}{24}$$

$$37. \frac{1}{10}$$

# Practice-Test

## Probability

Time: 50 minutes

M.M: 20

### SECTION-A

1. A die is thrown once. find the probability of getting an odd number. 1
2. A bag contains 4 red and 6 black balls. one ball is drawn from the bag at random. Find the probability of getting a black ball. 1

### SECTION-B

3. Find the probability of having 53 friday in a year. 2
4. One card is drawn at random from the well shuffled pack of 52 cards. Find the probability of getting a black face card or a red face card. 2

### SECTION-C

5. A box contains 5 Red, 4 green and 7 white marbles. One marbles is drawn at random from the box. What is the probability that marble is  
(i) not white      (ii) neither red nor white 3
6. A die is thrown once. find the probability that the number.  
(i) is an even prime number      (ii) is a perfect square 3

### SECTION-D

7. A box contains cards numbered 1,3,5,.....,35. Find the probability that tha card drawn is  
(i) a prime number less than 15      (ii) divisible by both 3 and 15 4
8. From a deck of 52 playing cadrs, king, queen and jack of a club are removed and a card is drawn from the remaining cards. Find the probabiliy that the card drawn is  
(i) a spade      (ii) a queen      (iii) a club 4

