

PROBABILITY SYNOPSIS

- **Random experiment:** If an experiment conducted under identical conditions can result in two or more outcomes it is called random experiment.
- **Sample space:** The set of all possible outcomes of an experiment is called sample space.
- **Simple event:** An event having single possible outcome.
- **Compound event:** An event having more than two outcomes.
- **Exhaustive events:** Two or more events are said to be exhaustive if their union is the full sample space.
- **Mutually exclusive:** Two or more events are said to be mutually exclusive if their intersection is null set.
- **Addition theorem in probabilities:**
 - i) $P(A \cup B) = P(A) + P(B)$ if A and B are mutually exclusive.
 - ii) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ if A and B are not mutually exclusive.
- **Odds against and odds in favour of an event:** If p is the probability of an event E, then i) odds in favour of E = $\frac{p}{1-p}$ ii) odds against E = $\frac{1-p}{p}$

PROBABILITY

SECTION A(1 Mark)

MCQ

1. What are the chances that no two boys are sitting together for a photograph if there are 5 girls and 2 boys?
a. 1/21 b. 4/7 c. 2/7 d. 5/7
2. What is probability of drawing two clubs from a well shuffled pack of 52 cards?
a. 13/51 b. 1/17 c. 1/26 d. 13/17
3. When two coins are tossed simultaneously, what are the chances of getting at least one tail?
a. 3/4 b. 1/5 c. 4/5 d. 1/4
4. In a drawer there are 4 white socks, 3 blue socks and 5 grey socks. Two socks are picked randomly. What is the possibility that both the socks are of same color?
a. 4/11 b. 1 c. 2/33 d. 19/66
5. In a drawer there are 5 black socks and 3 green socks. Two socks are picked randomly one after the other without replacement. What is the possibility that both the socks are black?
a. 5/14 b. 5/8 c. 3/8 d. 5/16
6. What is the possibility of having 53 Thursdays in a non-leap year?
a. 6/7 b. 1/7 c. 1/365 d. 53/365

7. A box has 5 black and 3 green shirts. One shirt is picked randomly and put in another box. The second box has 3 black and 5 green shirts. Now a shirt is picked from second box. What is the probability of it being a black shirt?

- a. $\frac{4}{9}$ b. $\frac{29}{72}$ c. $\frac{8}{72}$ d. $\frac{3}{16}$

8. On rolling a dice 2 times, the sum of 2 numbers that appear on the uppermost face is 8. What is the probability that the first throw of dice yields 4?

- a. $\frac{2}{36}$ b. $\frac{1}{36}$ c. $\frac{1}{6}$ d. $\frac{1}{5}$

9. A box has 6 black, 4 red, 2 white and 3 blue shirts. What is probability of picking at least 1 red shirt in 4 shirts that are randomly picked?

- a. $\frac{4}{15}$ b. $\frac{24}{455}$ c. $\frac{69}{91}$ d. $\frac{22}{91}$

10. A box has 6 black, 4 red, 2 white and 3 blue shirts. What is the probability that 2 red shirts and 1 blue shirt get chosen during a random selection of 3 shirts from the box?

- a. $\frac{18}{455}$ b. $\frac{7}{15}$ c. $\frac{7}{435}$ d. $\frac{7}{2730}$

FILL IN THE BLANKS

1. A box has 6 black, 4 red, 2 white and 3 blue shirts. The probability of drawing 2 black shirts if they are picked randomly is
2. In a set of 30 game cards, 17 are white and rest are green. 4 white and 5 green are marked IMPORTANT. If a card is chosen randomly from this set, then the possibility of choosing a green card or an 'IMPORTANT' card is
3. There are 2 pots. One pot has 5 red and 3 green marbles. Other has 4 red and 2 green marbles, then the probability of drawing a red marble is
4. The possibility of drawing a jack or a spade from a well shuffled standard deck of 52 playing cards is
5. Three unbiased coins are tossed. The probability of getting at least 2 tails is

VSA

1. Find the probability getting at least one head heads when two coins are tossed.
2. A die is tossed .What is the probability of getting a number greater than 4.
3. 20 cards are numbered from 1 to 20. One card is drawn at random. What is the probability that the number on the card is not divisible by 3?
4. From a well shuffled deck of cards Find the probability of getting i) an eight of hearts
ii) a face card
5. Two dice are thrown. Find the i) odds in favour of getting the sum 5 ii) the odds against getting the sum 6

SECTION B(4 Marks)

6. In a single throw of two dice find the probability that a neither a doublet nor a total of 10 will appear.
7. A natural number is chosen at random from among the first 500. what is the probability that the number chosen is divisible by 3 or 5.
8. A card is drawn from a well shuffled pack of 52 cards. Find the probability of it

being a spade or a king. In some parts of the country playing cards is a part of festival celebration. Do you agree to this custom? Give your opinion

9. A committee of 5 persons is to be constituted from a group of 6 gents and 8 ladies

If the selection is made randomly find the probability that there are 3 ladies and 2 gents in the committee. In our society do you think men and women are given equal rights? Comment on this.

10. 3 cards are drawn from a pack of 52 cards. Find the probability that i) all the cards are of the same suit ii) one is a king and the other is a queen and the third is a jack.

11. Two students Anil and Vijay appeared in an examination. The probability that Anil will qualify the examination is 0.05, that Vijay will qualify is 0.10. The probability that both will qualify is 0.02. Find the probability that

i) both will not qualify

ii) At least one of them will not qualify

iii) only one of them will qualify

12. The letters of the word SOCIETY are placed at random in a row. What is the probability that the three vowels come together?

13. Two cards are drawn from a pack of 52 cards. What is the probability that either both are red or both are kings.

14. The Probability of the occurrence of two events E_1 and E_2 are 0.25 and 0.50 respectively. The probability of their simultaneous occurrence is 0.14. Find the probability that neither E_1 nor E_2 occurs.

15. If E_1 and E_2 are two events such that $P(E_1)=0.5$, $P(E_2)=0.3$ and $P(E_1 \cap E_2)=0.1$. Find

i) at least one event happens ii) E_1 happens and not E_2

iii) E_2 happens and not E_1 iv) neither of the event happens.

SCORING KEY

MCQ

1. d 2. b 3. a 4. d 5. a 6. b 7. b 8. b 9. c 10. a

FILL IN THE BLANKS

1. $1/7$ 2. $17/30$ 3. $31/48$ 4. $4/13$ 5. $1/2$

1.	$\frac{3}{4}$			
2.	$\frac{1}{3}$			
3.	$\frac{7}{10}$			
4.	$\frac{1}{52}, \frac{3}{13}$			
5.	$\frac{1}{8}, \frac{31}{5}$			
6.	$\frac{7}{9}$			
7.	$\frac{233}{500}$			
8.	$\frac{4}{13}$			
9.	$\frac{60}{143}$			
10.	i) $\frac{22}{425}$		ii) $\frac{48}{16575}$	
11.	0.87	0.98	0.11	
12.	$\frac{1}{7}$			
13.	$\frac{55}{221}$			
14.	0.39			
15.	0.7	0.4,	0.2	0.3