

PRACTICE QUESTIONS ADDITION LAW OF PROBABILITY**EXERCISE – 2.5****ADDITION LAW OF PROBABILITY**

1. An ordinary die is thrown once. Find the probability that the number obtained is
 - (a) an odd number or factor of 6
 - (b) an even number or less than 5
 - (c) a prime number or greater than 2.

(Ans : $\frac{5}{6}, \frac{5}{6}, \frac{5}{6}$)
2. From an ordinary pack of 52 playing cards the seven of diamonds has been lost. A card is drawn from the well-shuffled pack. Find the probability that it is
 - (a) a diamond
 - (b) a Queen
 - (c) a diamond or a Queen
 - (d) a diamond or a seven
 - (e) a heart or a seven

(Ans : $\frac{4}{17}, \frac{4}{51}, \frac{5}{17}, \frac{5}{17}, \frac{15}{51}$)
3. The probability that a boy in class 2 is in the football team is 0.4 and the probability that he is in the chess team is 0.5. if the probability that a boy in the class is in both teams is 0.2, find the probability that a boy chosen at random is in the football or the chess team

(Ans : $\frac{7}{10}$)
4. In a group of 30 students all study at least one of the subjects Physics and Biology. 20 attend the Physics class and 21 attend the Biology class. Find the probability that a student chosen at random studies both Physics and Biology.

(Ans : $\frac{11}{30}$)
5. In a class of 100 students, 54 studied mathematics, 69 studied history and 35 studied both mathematics and history. If one of three students is selected at random, find the probability that
 - (a) the student took mathematics or history
 - (b) the student did not take either of these subjects
 - (c) the student took history but not mathematics

(Ans : 0.88, 0.12, 0.34)
6. Three Coins are tossed once. Find the probability that coins show
 - (a) at least one head or at most one tail
 - (b) at least two heads or at most two tails
 - (b) at least three heads or at most three tails

(Ans : $\frac{7}{8}, \frac{7}{8}, 1$)

7. Two ordinary dice are thrown. Find the Probability that
(a) sum of the scores is an even number or multiple of 3
(b) product of scores is an odd number or factor of 20
(c) difference of scores is a prime number or greater than 3
(Ans : $\frac{2}{3}, \frac{1}{2}, \frac{5}{9}$)
8. For Events A and B, $P(A) = 0.7$, $P(B \cup A) = 0.9$, $P(A \cap B) = 0.3$ Find
(a) $P(A \cap B')$
(b) $P(B \cap A')$
(c) $P(A' \cap B')$
(d) $P(A' \cup B)$
(e) $P(A' \cup B')$
(Ans : 0.4, 0.2, 0.1, 0.6, 0.7)
9. It is known that $P(X) = \frac{1}{2}$ and $P(Y) = \frac{1}{4}$. Given that X and Y are mutually exclusive events, find
(a) $P(X \cup Y)$
(b) $P(X \cap Y)$
(c) $P(Y \cap X')$
(Ans : 0.75, 0, 0.25)
10. (a) A coin is tossed twice. Event A contains outcomes having heads only and event B contains outcomes having tails only. Check whether the events A and B are mutually exclusive or not.
(b) A and B are two events such that
 $P(A) = \frac{8}{15}$, $P(B) = \frac{2}{3}$ and $P(A \cap B) = \frac{1}{5}$. Are A and B exhaustive events.
(Ans : Mutually Exclusive, Yes)

PRACTICE QUESTIONS MULTIPLICATIONS LAW OF PROBABILITY**EXERCISE – 2.6****MULTIPLICATION LAW OF PROBABILITY**

1. A die is thrown twice. Find the probability that odd numbers appears on the first throw and prime number appears on the second throw.

$$(Ans : \frac{1}{4})$$

2. (a) Determine the probability of getting two heads in two successive tosses of a balanced coin.

(b) Find the probability of throwing two consecutive totals of 7 in two throws of the die.

$$(Ans : \frac{1}{4}, \frac{1}{36})$$

3. Two cards are drawn from a deck of 52 playing cards in such a way that the card is replaced after the first draw. Find the probability if

(a) the first card is a king and the second is a queen

(b) Both cards are faces cards

$$(Ans : \frac{1}{169}, \frac{9}{169})$$

4. A bag contains 8 red, 5 white, and 7 black balls. Three balls are drawn from the bag. What is the probability that the first ball is red, second ball is white and third ball is black, when every time ball is replaced.

$$(Ans : \frac{7}{200})$$

5. The probability that a man will be alive in 25 years is $\frac{3}{5}$ and that his wife will be alive in 25 years is $\frac{2}{3}$. Find the probability that

(a) both will be alive in 25 years

(b) only the man will be alive in 25 years

(c) only the wife will be alive in 25 years

(d) at least one will be alive in 25 years

(e) neither will be alive in 25 years

$$(Ans : \frac{2}{5}, \frac{1}{5}, \frac{4}{15}, \frac{13}{15}, \frac{2}{15})$$

6. A can hit a target four times in 5 shots, B three times in 4 shots and C twice in 3 Shots. They fire a Volley. What is the probability that at least two shots hit.

$$(Ans : 0.8333)$$

7. Three groups of children contain respectively 3 girls and 1 boy, 2 girls and 2 boys, 1 girl and 3 boys. One child is selected from each group. Find the probability that three selected children consist of 1 girl and 2 boys.

$$(Ans : 0.4063)$$

8. Three missiles are fired at a target. The probabilities of hitting the target are 0.4, 0.5 and 0.6 respectively. If the missiles are fired independently, what is the probability that
- (a) all the missiles hit the target
 - (b) at least one missile hits the target
 - (c) at most one missile hits the target
 - (d) exactly one missile hits the target
 - (e) exactly two missiles hit the target
- (Ans : 0.12, 0.88, , 0.38, 0.38)
9. There are three families each having four children. Two boys and two girls, three boys and one girl, one boy and three girls. A child from each party is invited to a party. Find the probability that
- (a) only girls turn up for party
 - (b) only boys turn up for party
 - (c) two girls and one boy turn up for party
- (Ans : $\frac{3}{32}$, $-\frac{13}{32}$)
10. Check that the events A and B are independent or not.
- (a) Events A and B are such that $P(A) = \frac{1}{3}$, $P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{6}$
 - (b) Events A and B are such that $P(A) = \frac{2}{3}$, $P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{5}{6}$