

Problem Set - VI

1. What is the probability that a number selected from the numbers 1, 2, 3, ..., 20, is a prime number when each of the given numbers is equally likely to be selected?
2. Tickets are numbered from 1 to 18 are mixed up together and then a ticket is drawn at random. Find the probability that the ticket has a number, which is a multiple of 2 or 3.
3. In a lottery of 100 tickets numbered 1 to 100, two tickets are drawn simultaneously. Find the probability that both the tickets drawn have prime numbers.
4. Find the probability that a leap year selected at random will contain 53 Sundays.
5. The odds in favour of an event are 2:7. Find the probability of occurrence of this event.
6. The odds against of an event are 5:7. Find the probability of occurrence of this event.
7. If there are two children in a family, find the probability that there is atleast one girl in the family.
8. From a group of 3 men and 2 women, two persons are selected at random. Find the probability that atleast one woman is selected.
9. A box contains 5 defective and 15 non-defective bulbs. Two bulbs are chosen at random. Find the probability that both bulbs are non-defective.
10. Four cards are drawn at a time from a pack of 52 playing cards. Find the probability of getting all the four cards of the same suit.
11. A natural number is chosen at random from amongst the first 300. What is the probability that the number chosen is divisible by 3 or 5?
12. A box contains 5 red balls, 8 green balls and 10 pink balls. A ball is drawn at random from the box. What is the probability that the ball drawn is either red or green?

13. In a class 40% of the students offered Physics, 20% offered Chemistry and 5% offered both. If a student is selected at random, find the probability that he was offered Physics or Chemistry only.
14. In a given race, the odds in favour of horses H_1, H_2, H_3 and H_4 are 1:2, 1:3, 1:4, 1:5 respectively. Find the probability that one of them wins the race.
15. A die is rolled. If the outcome is an odd number, what is the probability that it is a prime number?
16. In a class 45% students read English, 30% read French and 20% read both English and French. One student is selected at random. Find the probability that he reads English, if it is known that he reads French.
17. Two persons A and B throw a die alternatively till one of them gets a three and wins the game. Find their respective probabilities of winning.
18. A problem is given to three students whose chances of solving it are $\frac{1}{2}, \frac{1}{3}$ and $\frac{1}{4}$ respectively. What is the probability that the problem will be solved?
19. An air gun can take a maximum of 4 shots at a balloon at some distance. The probabilities of hitting the balloon at the first, second, third and fourth shot are 0.1, 0.2, 0.3 and 0.4 respectively. What is the probability that the balloon is hit?
20. A speaks truth in 60% and 80% of the cases. In what percentage of cases are they likely to contradict each other narrating the same incident?

Answers:

1. $\frac{2}{5}$, 2. $\frac{2}{3}$, 3. $\frac{2}{33}$, 4. $\frac{2}{7}$, 5. $\frac{2}{9}$, 6. $\frac{7}{12}$, 7. $\frac{3}{4}$, 8. $\frac{7}{10}$, 9. $\frac{21}{38}$, 10. $\frac{44}{4165}$, 11. $\frac{1}{2}$, 12. $\frac{13}{23}$, 13. 55%, 14. $\frac{57}{60}$, 15. $\frac{2}{3}$, 16. $\frac{2}{3}$, 17. $\frac{6}{11}$, 18. $\frac{3}{4}$, 19. 0.6976, 20. 44%