

MAN 128 1.0 Introduction to Statistics

Tutorial 2

Counting techniques

1. There are five finalists in the MS Sri Lanka pageant. In how many ways may the judges choose a winner and a first runner-up?
2. A multiple-choice test consists of 7 questions, each permitting a choice of 4 alternatives. In how many ways may a student fill in the answers if they answer each question?
3. In how many ways may can 4 persons get into the bus if there were 7 people in a bus stop?
4. In how many ways may 5 people line up if two of the people refuse to stand next to each other?
5. How many permutations are there of the letters in the word “fleet”?
6. An Elle team plays 10 games during the season. In how many ways can it end the season with 5 wins, 3 losses, and 2 ties?
7. A raffle draw allows a person to win three gifts for the same ticket. Organizers draw the ticket numbers for the first gift and record the name and again do the same procedure for next two places respectively. How many different ways are there to distribute three gifts among 15 contesters?
8. How many arrangements of the letters of the word DEMONS are possible if:
 - a. They have DE together in order?
 - b. They have DEM together in any order?
 - c. D, E and M are not to be together?
9. From the digits 0, 1, 2, 3, 4
 - a. How many numbers greater than 4 000 can be formed?
 - b. How many 4 digit numbers would be even?
10. If 4 Novels are selected from 6 different Novels and 3 Fictions are chosen from 5 different Fictions, how many ways can the seven books be arranged on a shelf:
 - a. If there are no restrictions?
 - b. If the 4 Novels remain together?

11. At a dinner party 4 men and 4 women sit at a round table. In how many ways can they sit if:
- There are no restrictions?
 - Kamal, Samal and Amal must sit together?
 - Neither Kamal nor Samal can sit next to Amal?
12. In how many ways can 10 differently coloured beads be threaded on a string?

Answers

- 5.4
- 4^7
- $P(7,4)$
- $5! - 2 \cdot 4!$
- $5!/2!$
- $C(10,5) \cdot C(5,3)$
- $C(17,3)$
- | | | |
|-------------|--------------------------|--------|
| a. $P(5,5)$ | b. $P(3,3) \cdot P(4,4)$ | c. a-b |
|-------------|--------------------------|--------|
- | | |
|---|---|
| a. $P(4,1) \cdot P(4,4) + 1 \cdot P(4,3)$ | b. $P(4,3) \cdot P(3,1) - 1 \cdot P(3,2) \cdot 2$ |
|---|---|
- | | |
|-----------------------------------|--|
| a. $C(6,4) \cdot C(5,3) \cdot 7!$ | b. $P(6,4) \cdot C(5,3) \cdot 4!$ or $C(6,4) \cdot 4! \cdot C(5,3) \cdot 4!$ |
|-----------------------------------|--|
- | | | |
|---------|------------------|-------------------------|
| a. $7!$ | b. $3! \cdot 5!$ | c. $5 \cdot 4 \cdot 5!$ |
|---------|------------------|-------------------------|
- $9!/2$