

## CHAPTER 15

# Probability

### Example:

The following table shows the number of vehicles owned by 300 families in a neighborhood.

| Number of Vehicles | 0  | 1   | 2   | 3  |
|--------------------|----|-----|-----|----|
| Number of families | 25 | 125 | 105 | 45 |

Find the probability that a family chosen at random owns

- (i) More than two vehicles
- (ii) Exactly two vehicles
- (iii) More than one vehicle

### Sol:

Let 'S' be the sample space, the number of vehicles owned by 300 families,

$$n(S) = 300$$

(i) Let “ $E_1$ ” be the event of getting, more than 2 vehicles,

$$\Rightarrow n(E_1) = 45$$

$$\therefore \boxed{P(E_1) = \frac{n(E_1)}{n(S)}} \Rightarrow P(E_1) = \frac{45}{300} \Rightarrow \boxed{P(E_1) = \frac{3}{20}}$$

(ii) Let “ $E_2$ ” be the event of getting, exactly 2 vehicles,

$$\Rightarrow n(E_2) = 105$$

$$\therefore \boxed{P(E_2) = \frac{n(E_2)}{n(S)}} \Rightarrow P(E_2) = \frac{105}{300} \Rightarrow \boxed{P(E_2) = \frac{7}{20}}$$

(iii) Let “ $E_3$ ” be the event of getting, more than one vehicle,

$$P(E_3) = P(E_1) + P(E_2)$$

$$= \frac{3}{20} + \frac{7}{20}$$

$$= \frac{3+7}{20}$$

$$= \frac{10}{20}$$

$$\therefore \boxed{P(E_3) = \frac{1}{2}}$$