

Activity 33

OBJECTIVE

To write the sample space, when a coin is tossed once, two times, three times, four times.

MATERIAL REQUIRED

One rupee coin, paper pencil/pen, plastic circular discs, marked with Head (H) and Tail (T).

METHOD OF CONSTRUCTION

1. Toss a coin once. It can have two outcomes – Head or Tail.
2. Make a tree diagram showing the two branches of a tree - with H (Head) on one branch and T (Tail) on the other (see Fig. 33.1).
3. Write its sample space.
4. Toss a coin twice. It can have four outcomes (see Fig. 33.2)
5. Repeat the experiment with tossing the coin three times, four times,, n and write their sample spaces, if possible. (see Fig. 33.3 and 33.4).

DEMONSTRATION

1. If a coin is tossed once, the sample space is

$$S = \{H, T\}$$

$$\text{Number of elements in } S = 2 = 2^1$$

2. When a coin is tossed twice, the sample space is

$$S = \{HH, HT, TH, TT\}$$

$$\text{Number of elements in } S = 4 = 2^2$$



Fig. 33.1

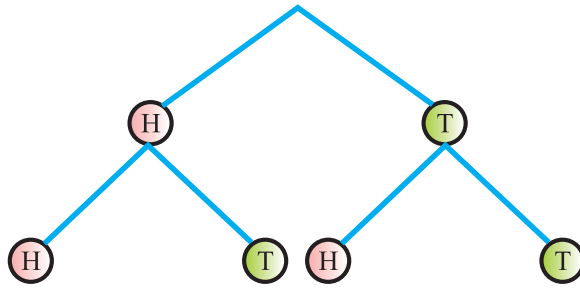


Fig. 33.2

3. When a coin is tossed three times, the sample space is

$$S = \{HHH, HHT, HTH, HTT, THH, THT, TTH, TTT\}$$

$$\text{Number of elements in } S = 8 = 2^3$$

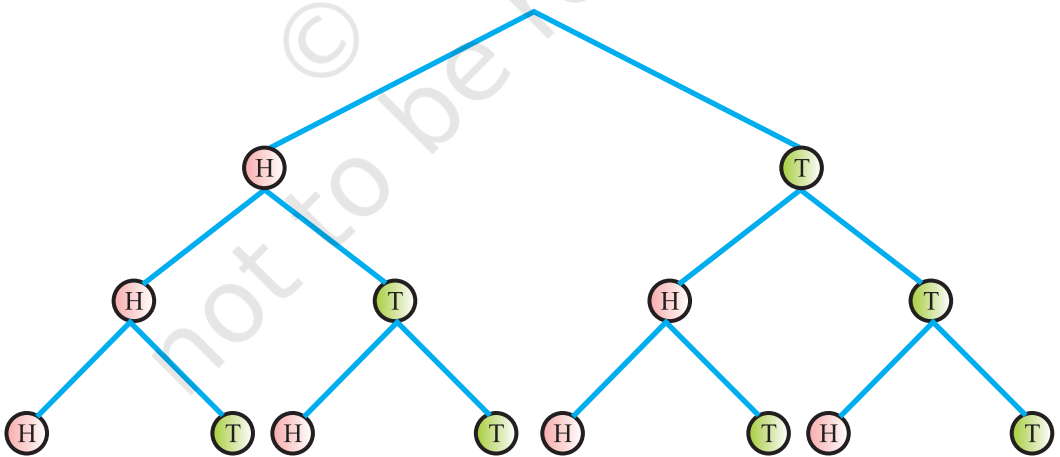


Fig. 33.3

4. When a coin is tossed four times, the $S =$ Sample space is

$$\left\{ \begin{array}{l} \text{HHHH, HHHT, HHTH, HHTT, HTHH, HTHT, HTTH, HTTT,} \\ \text{THHH, THHT, THTH, THTT, TTHH, TTHT, TTTH, TTTT} \end{array} \right\}$$

Number of elements in $S = 16 = 2^4$ and so on.

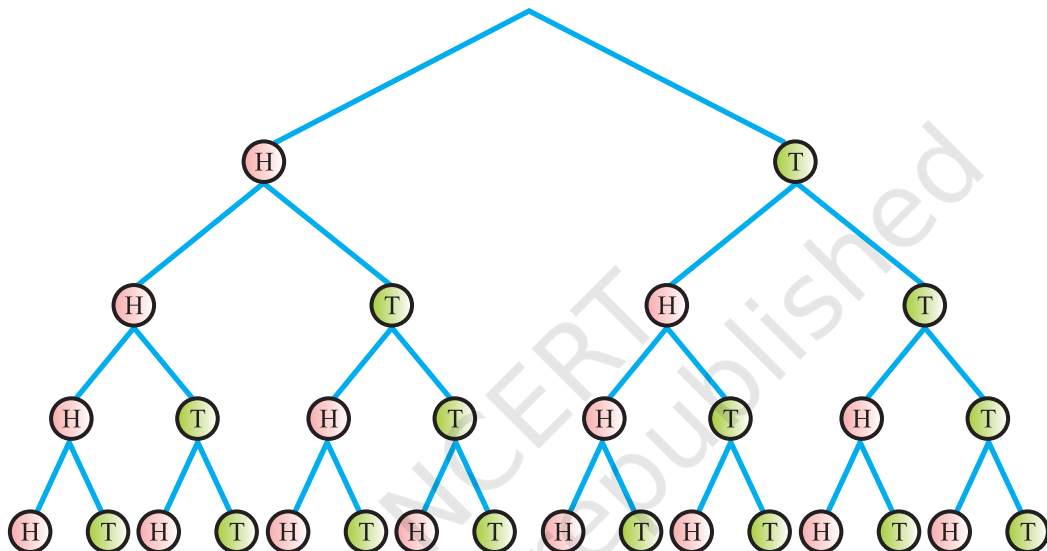


Fig. 33.4

OBSERVATION

Number of elements in sample space, when a

1. coin is tossed once = _____.
2. coin is tossed twice = _____.
3. coin is tossed three times = _____.
4. coin is tossed four times = _____.

APPLICATION

Sample space of an experiment is useful in determining the probabilities of different events associated with the sample space.