

(5) Let A be a set of all 4-digit numbers (natural) whose exactly one digit is 7. Then the probability that a randomly chosen element of A leaves remainder 2 when divided by 5 is:

Soln: Total no. of cases =

n (when 7 appears on 1000's place)

+ n (when 7 does not appear on 1000's place)

$$= (9 \times 9 \times 9) + (8 \times 9 \times 9 \times 3)$$

$$= 9 \times 9 \times 33$$

Favourable cases =

n (last digit 7 & 7 appear once)

+ n (last digit 2 & 7 appear once)

$$= (8 \times 9 \times 9) + [(9 \times 9) + (8 \times 9 \times 2)]$$

$$= 8 \times 9 \times 9 + 25 \times 9$$

$$\therefore P(E) = \frac{8 \times 9 \times 9 + 25 \times 9}{9 \times 9 \times 33} = \frac{97}{297}$$