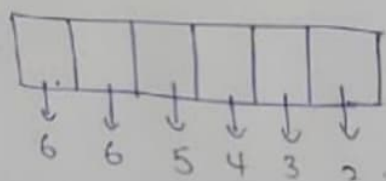


Previous year questions

JEE MAIN 2020+2021

① Let A denote the event that a 6 digit integer formed by 0, 1, 2, 3, 4, 5, 6 without repetitions, be divisible by 3. Then probability of event A is equal to:

soln:

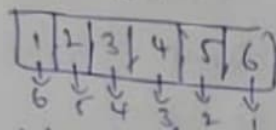


$$\begin{aligned} \text{Total no. of cases} &= 6 \times 6 \times 5 \times 4 \times 3 \times 2 \\ &= 4320. \end{aligned}$$

Favourable cases:

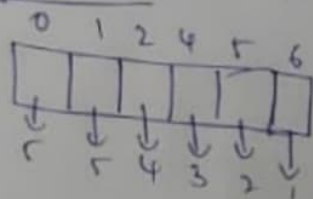
In order to be divisible by 3, the sum must be divisible by 3.

case (i)



$$\begin{aligned} \text{No. of ways} &= 6 \times 5 \times 4 \times 3 \times 2 \times 1 \\ &= 720 \end{aligned}$$

case (ii)



$$\begin{aligned} \text{No. of ways} &= 5 \times 4 \times 3 \times 2 \times 1 \\ &= 600 \end{aligned}$$

Case III

0, 1, 2, 3, 4, 5

$$\begin{aligned}\text{No. of ways} &= 5 \times 5 \times 4 \times 3 \times 2 \times 1 \\ &= 600.\end{aligned}$$

$$\begin{aligned}\therefore \text{Total No. of favourable cases} &= 600 + 600 + 720 \\ &= 1920.\end{aligned}$$

$$P(A) = \frac{1920}{4320} = \frac{4}{9}$$