A die is loaded in such a way that each odd number is twice as likely to occur as each even number. Find P(G), where G is the event that a number greater than 3 occurs on a single roll of the die.

Solution:

Given that probability of odd numbers

= 2 × (Probability of even number)

⇒ P (Odd) = 2 × P (Even)

Now, P (Odd) + P (Even) = 1

⇒ 2 P (Even) + P (Even) = 1

⇒ 3 P (Even) = 1

P (Even) = 1/3

So,

$$P(\text{Odd}) = 1 - \frac{1}{3} = \frac{3-1}{3} = \frac{2}{3}$$

Now, Total number occurs on a single roll of die = 6

And the number greater than 3 = 4, 5 or 6

So, P (G) = P (number greater than 3)

= P (number is 4, 5 or 6)

Here, 4 and 6 are even numbers and 5 is odd

∴ P (G) = 2 × P (Even) × P (Odd)

= 2 × 1/3 × 2/3

= 4/9

Hence, the required probability is 4/9