NCERT Q-12.13.3.29

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Question:- Two biased dice are thrown together. For the first die P(6) = 1/2, the other scores being equally likely while for the second die, P(1) = 2/5 and the other scores are equally likely. Find the probability distribution of 'the number of ones seen'.

Solution:
For die 1 :-

$$P(6) = \frac{1}{2} \tag{1}$$

$$P(6)' = 1 - P(6) = \frac{1}{2} \tag{2}$$

$$P(1) = \left(\frac{1}{5}\right).\left(1 - \frac{1}{2}\right) = \frac{1}{10} \tag{3}$$

$$\tag{4}$$

For die 2 :-

$$P(1) = \frac{2}{5} \tag{5}$$

$$P(1)' = 1 - P(1) = \frac{3}{5} \tag{6}$$

Let $P_i(1)$ denotes probability of getting i times 1.

$$P_0(1) = (1 - \frac{1}{10}).\left(\frac{3}{5}\right) = \frac{27}{50} \tag{7}$$

$$P_1(1) = (1 - \frac{1}{10}).\left(\frac{2}{5}\right) + \left(\frac{1}{10}\right).\left(\frac{3}{5}\right) = \frac{21}{50} \tag{8}$$

$$P_2(1) = \left(\frac{1}{10}\right).\left(\frac{2}{5}\right) = \frac{2}{50} \tag{9}$$

$$\tag{10}$$

i	0	1	2
$P_i(1)$	27/50	21/50	2/50

TABLE 0
PROBABILITY OF NO. OF 1'S