Ncert exempler

KUNWAR DUSHYANT SINGH EE22BTECH11031

Question 10.13.3.34
There are 1000 sealed envelopes in a box, 10 of them contain a cash prize of Rs 100 each, 100 of them contain a cash prize of Rs 50 each and 200 of them contain a cash prize of Rs 10 each and rest do not contain any cash prize. If they are well shuffled and an envelope is picked up out, what is the probability that it contains no cash prize?.
Solution: Let

TABLE I
RANDOM VARIABLE

Variable	value	Description
X_1	1	cash prize of Rs 100
	0	no cash prize of Rs 100
X_2	1	cash prize of Rs 50
	0	no cash prize of Rs 50
X_3	1	cash prize of Rs 10
	0	no cash prize of Rs 10
Y	1	Envelope with prize
	0	Envelope with no prize

$$pX_1(1) = \frac{10}{1000} \tag{1}$$

$$= \frac{1}{100} \tag{2}$$

$$= 0.01 \tag{3}$$

$$pX_2(1) = \frac{100}{1000} \tag{4}$$

$$= \frac{1}{10} \tag{5}$$

$$= 0.1 \tag{6}$$

$$pX_3(1) = \frac{200}{1000} \tag{7}$$

$$= \frac{2}{10} \tag{8}$$

$$= 0.2 \tag{9}$$

Probablity of no cash prize

$$pY(0) = 1 - (pX_1(1) + pX_2(1) + pX_3(1)) \tag{10}$$

$$= 1 - \frac{31}{100} \tag{11}$$

$$= 0.69 \tag{12}$$