Solution of Q12.13.3.80

SUJAL GUPTA - EE22BTECH11052

A flashlight has 8 batteries out of which 3 are dead. If two batteries are selected without replacement and tested, find the probability that both are dead.

Solution: Let the random variable be X_i for denoting the battery being dead.

Variable	Description	Value
X_i	*ith* battery being dead $\forall i = 1, 2$	$\{0, 1\}$
n	no of batteries selected	2

$$\Pr(X_1 = 0) = \frac{3}{8} \tag{1}$$

$$\Pr(X_2 = 0|X_1 = 0) = \frac{\Pr(X_2 = 0)\Pr(X_1 = 0)}{\Pr(X_1 = 0)} \tag{2}$$

$$\Pr(X_2 = 0)\Pr(X_1 = 0) = \Pr(X_1 = 0)\Pr(X_2 = 0|X_1 = 0) \tag{3}$$

$$= \frac{3}{8} * \frac{2}{7} \tag{4}$$

$$= \frac{3}{28} \tag{5}$$