Assignment3($Q_1$1.16.3.13)
NCERT EXAMPLER
Probability And Random Processes

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I. Q11.16.3.13

A bag contains 8 red and 5 white balls. Three balls are drawn at random. Find the Probability that
(a) All the three balls are white
(b) All the three balls are red
(c) One ball is red and two balls are white

Solution: Let,
X1, X2 and X3 be three random variables such that
X1 : first drwan ball
X2 : second drawn ball
X3 : thrid drawn ball

And,

Red Ball : 0 White Ball : 1

(a) All the three balls are white:
P(X1=1, X2=1, X3=1) = 5/13*4/12*3/11
= 5/143

(b) All the three balls are red:
P(X1=0, X2=0, X3=0) = 8/13*7/12*6/11
= 28/143

(c)Now, let's calculate the total probability of getting one red and two white balls (which includes the cases where X = 1 red and 2 white and X = 2 red and 1 white):

Total probability of one red and two white = P(X1=0, X2=1, X3=1) + P(X1=1, X2=0, X3=1) + P(X1=0, X2=1, X3=1)

Total probability = 160/1716 + 160/1716 + 160/1716

= 3*160/1716
= 120/429