Probability Assignment 1

EE22BTECH11026 - KARTHIKEYA HANU PRAKASH KANITHI

Question :

Solution: Given that A and B are mutually exclusive events. so,

$$\Pr(AB) = 0 \tag{1}$$

$$\begin{aligned}
\Pr(A') &= 1 - \Pr(A) && (2)\\
&= 1 - 0.35 && (3)\\
&= 0.65 && (4)\\
\Pr(B') &= 1 - \Pr(B) && (5)\\
&= 1 - 0.45 && (6)\\
&= 0.55 && (7)\\
\Pr(A+B) &= \Pr(A) + \Pr(B) - \Pr(AB) && (8)\\
&= 0.35 + 0.45 - 0 && (9)\\
&= 0.80 && (10)\\
\Pr(AB) &= 0 && (11)
\end{aligned}$$

For $\Pr(AB')$ consider $\Pr(A')$.

$$\begin{aligned}
\Pr(A) &= \Pr(A.S) && (12)\\
&= \Pr(A.(B+B')) && (13)\\
&= \Pr(AB + AB') && (14)\\
&= \Pr(AB) + \Pr(AB') - \Pr(AB.AB') && (15)\\
&= \Pr(AB) + \Pr(AB') - \Pr(AA.(BB')) && (16)\\
&= \Pr(AB) + \Pr(AB') && (17)\\
\Pr(AB') &= \Pr(A) - \Pr(AB) && (18)\\
&= 0.35 - 0 && (19)\\
&= 0.35 && (20)\\
\Pr(A'B') &= \Pr((A+B)') && (21)\\
&= 1 - \Pr(A+B) && (22)\\
&= 1 - 0.80 && (23)\\
&= 0.20 && (24)
\end{aligned}$$