Assignment 1

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1 Problem 6.5

If A and B are any two events such that P(A) + P(B) – P(A and B) = P(A), the
(A) P(B/A) = 1
(B) P(A/B) = 1
(C) P(B/A) = 0
(D) P(A/B) = 0

2 Solution

Given,
P(A)+P(B)–P(AB)=P(A) $\longrightarrow$ (6.5.1)
We also know that,
P(A+B)=P(A)+P(B)-P(AB) $\longrightarrow$ (6.5.2)
By comparing equations (6.5.1) and (6.5.2), we get
$\Rightarrow$ P(A+B)=P(A) $\longrightarrow$ (6.5.3)
Substituting equation (6.5.3) in equation (6.5.2), we get
P(B)=P(AB) $\longrightarrow$ (6.5.4)
Dividing equation (6.5.4) by P(B) on both sides we get $\frac{P(AB)}{P(B)}$=1 $\longrightarrow$ (6.5.5)
from definition of conditional probability
P(A/B)=$\frac{P(AB)}{P(B)}$
$\Rightarrow$ P(A/B)=1.
HENCE OPTION-(B) IS CORRECT.