Assignment 5 (Class 11 Miscellaneous ex 16 7)

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***Abstract*—This document contains the solution to Cbse 11 Probability Miscellaneous problem 7**

PROBLEM

A and B are two events such that $\Pr(A) = 0.54$, $\Pr(B) = 0.69$ and $\Pr(AB) = 0.35$ Find

i) $\Pr(A + B)$
ii) $\Pr(A'B')$
iii) $\Pr(AB')$
iv) $\Pr(A'B)$

SOLUTION

Given $\Pr(A) = 0.54$, $\Pr(B) = 0.69$ and $\Pr(AB) = 0.35$

(i)

$$\Pr(A + B) = \Pr(A) + \Pr(B) - \Pr(AB) \quad (1)$$

on substituting values we will get

$$\Pr(A + B) = 0.54 + 0.69 - 0.35 \quad (2)$$
$$\Pr(A + B) = 0.88 \quad (3)$$

$\therefore$ the value of $\Pr(A + B)$ is 0.88

(ii)

$$\Pr(A'B') = \Pr\left((A + B)'\right) \quad (4)$$
$$= 1 - \Pr(A + B) \quad (5)$$

on substituting value from eq(3) in eq(5) we will get

$$\Pr(A'B') = 1 - 0.88 \quad (6)$$
$$= 0.12 \quad (7)$$

$\therefore$ the value of $\Pr(A'B')$ is 0.12

(iii) for finding $\Pr(AB')$ we go like below process

$$A = A(B + B') = AB + AB' \quad (8)$$

and also

$$(AB)(AB') = 0, \because BB' = 0 \quad (9)$$

Hence, AB and AB' are mutually exclusive so

$$\Pr(A) = \Pr(AB) + \Pr(AB') \quad (10)$$
$$\implies \Pr(AB') = \Pr(A) - \Pr(AB) \quad (11)$$

on substituting values in eq(11) we will get

$$\Pr(AB') = 0.54 - 0.35 \quad (12)$$
$$= 0.19 \quad (13)$$

$\therefore$ the value of $\Pr(AB')$ is 0.19

(iv) similarly based on eq(11) we can also get for $\Pr(A'B)$ like

$$\Pr(A'B) = \Pr(B) - \Pr(AB) \quad (14)$$

on substituting values in eq(14) we will get

$$\Pr(A'B) = 0.69 - 0.35 \quad (15)$$
$$= 0.34 \quad (16)$$

$\therefore$ the value of $\Pr(A'B)$ is 0.34