

Probability Assignment

G. Sai Harshith - EE22BTECH11022

Question : If A and B are mutually exclusive events, $\Pr(A) = 0.35$ and $\Pr(B) = 0.45$ then find

- 1) $\Pr(A')$
- 2) $\Pr(B')$
- 3) $\Pr(A + B)$
- 4) $\Pr(AB)$
- 5) $\Pr(AB')$
- 6) $\Pr(A'B')$

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

$$AB = 0 \quad (1)$$

1)

$$\Pr(A') = 1 - \Pr(A) \quad (2)$$

$$= 1 - 0.35 \quad (3)$$

$$= 0.65 \quad (4)$$

2)

$$\Pr(B') = 1 - \Pr(B) \quad (5)$$

$$= 1 - 0.45 \quad (6)$$

$$= 0.55 \quad (7)$$

3) From (1).

$$\Pr(A + B) = \Pr(A) + \Pr(B) - \Pr(AB) \quad (8)$$

$$= 0.35 + 0.45 - 0 \quad (9)$$

$$= 0.80 \quad (10)$$

4) From (1)

$$\Pr(AB) = 0 \quad (11)$$

5)

$$\Pr(A) = \Pr(A(1)) \quad (12)$$

$$= \Pr(A(B + B')) \quad (13)$$

$$= \Pr(AB + AB') \quad (14)$$

$$= \Pr(AB) + \Pr(AB') - \Pr(AB(AB')) \quad (15)$$

$$= \Pr(AB) + \Pr(AB') - \Pr(AA(BB')) \quad (16)$$

$$= \Pr(AB) + \Pr(AB') \quad (17)$$

$$BB' = 0. \text{ So, } \Pr(A(BB')) = 0$$

$$\Pr(AB') = \Pr(A) - \Pr(AB) \quad (18)$$

$$= 0.35 - 0 \quad (19)$$

$$= 0.35 \quad (20)$$

6)

$$\Pr(A'B') = \Pr((A + B)') \quad (21)$$

$$= 1 - \Pr(A + B) \quad (22)$$

$$= 1 - 0.80 \quad (23)$$

$$= 0.20 \quad (24)$$