

Assignment-2

EE22BTECH11012-A.Chhatrapati

Question 12.13.2.16 In a hostel, 60% of the students read Hindi newspaper, 40% read English newspaper and 20% read both Hindi and English newspapers. A student is selected at random.

- Find the probability that she reads neither Hindi nor English newspapers.
- If she reads Hindi newspaper, find the probability that she reads English newspaper.
- If she reads English newspaper, find the probability that she reads Hindi newspaper.

Solution: Given,

Random Variables	Events
A	The random variable for reading Hindi newspaper.
B	The random variable for reading English newspaper.
AB	The random variable for reading both Hindi and English newspaper.

$$(a) \Pr(A' B') = \Pr((A + B)') \quad (1)$$

$$= 1 - \Pr(A + B) \quad (2)$$

$$= 1 - (\Pr(A) + \Pr(B) - \Pr(AB)) \quad (3)$$

$$= 1 - \left(\frac{6}{10} + \frac{4}{10} - \frac{2}{10} \right) \quad (4)$$

$$= \frac{2}{10} \quad (5)$$

$$(b) \Pr(B|A) = \frac{\Pr(BA)}{\Pr(A)} \quad (6)$$

$$= \frac{\frac{2}{10}}{\frac{6}{10}} \quad (7)$$

$$= \frac{1}{3} \quad (8)$$

$$(c) \Pr(A|B) = \frac{\Pr(AB)}{\Pr(B)} \quad (9)$$

$$= \frac{\frac{2}{10}}{\frac{4}{10}} \quad (10)$$

$$= \frac{1}{2} \quad (11)$$