

# Question 11.16.3.64

## Probability and Random Processes

Sarvesh K  
EE22BTECH11046\*

### Question:12/13/3/64

You are given that A and B are two events such that  $\Pr(B) = \frac{3}{5}$ ,  $\Pr(A|B) = \frac{1}{2}$  and  $\Pr(A + B) = \frac{4}{5}$ , then  $\Pr(A)$  equals

**Solution:**

$$\Pr(A|B) = \frac{1}{2} \quad (1)$$

$$\frac{\Pr(AB)}{\Pr(B)} = \frac{1}{2} \quad (2)$$

$$\Pr(AB) = \frac{\Pr(B)}{2} \quad (3)$$

$$= \frac{3}{10} \quad (4)$$

$$\Pr(A + B) = \frac{4}{5} \quad (5)$$

$$\Pr(A) + \Pr(B) - \Pr(AB) = \frac{4}{5} \quad (6)$$

$$\Pr(A) = \frac{4}{5} - \Pr(B) + \Pr(AB) \quad (7)$$

Substitute  $\Pr(AB)$  from above

$$\Pr(A) = \frac{4}{5} - \frac{3}{5} + \frac{3}{10} \quad (8)$$

$$= \frac{1}{2} \quad (9)$$