

# ASSIGNMENT 1

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## Q.11.16.3.15

If  $E$  and  $F$  are events such that  $\Pr(E) = \frac{1}{4}$ ,  $\Pr(F) = \frac{1}{2}$  and  $\Pr(EF) = \frac{1}{8}$ , find

- (i)  $\Pr(E + F)$
- (ii)  $\Pr(E'F')$

**solution:**

- (i)  $\Pr(E + F)$

For given two events  $E$  and  $F$ , we know that,

$$\Pr(E + F) = \Pr(E) + \Pr(F) - \Pr(EF) \quad (1)$$

$$\Rightarrow \Pr(E + F) = \frac{1}{4} + \frac{1}{2} - \frac{1}{8} \quad (2)$$

$$= \frac{5}{8} \quad (3)$$

$$\therefore \Pr(E + F) = \frac{5}{8} \quad (4)$$

- (ii)  $\Pr(E'F')$

For given two events  $E$  and  $F$ , we know that,

$$(E'F') = (E + F)' \quad (5)$$

$$\Pr(E'F') = \Pr((E + F)') \quad (6)$$

$$\Rightarrow \Pr(E'F') = 1 - \Pr(E + F) \quad (7)$$

$$\Rightarrow \Pr(E'F') = 1 - \frac{5}{8} \quad (8)$$

$$= \frac{3}{8} \quad (9)$$

$$\therefore \Pr(E'F') = \frac{3}{8} \quad (10)$$