

(Lecture)  
10

## Formulas

$$ii) \quad \begin{array}{l|l} x \cdot 0 = 0 & x \cdot 1 = x \\ x + 0 = x & x \cdot 1 = 1 \end{array}$$

$$i) \quad \bar{x} \cdot y = x' + y'$$

$$\bar{x} + y = x' \cdot y'$$

$$iii) \quad x + y = y + x$$

$$iv) \quad (x + y) + z = x + (y + z)$$

$$(x \cdot y) \cdot z = x \cdot (y \cdot z)$$

$$v) \quad x \cdot (y + z) = x \cdot y + x \cdot z$$

$$x + (y \cdot z) = (x + y) \cdot (x + z)$$

$$vi) \quad x + xy = x \quad \therefore \quad x \cdot (1 + y) = x \cdot 1 = x$$

Question:-

$$= x' + x'y' + x'y'$$

$$= x'(1 + y') + xy'$$

$$= x \cdot 1 + xy'$$

$$= \boxed{x + xy'}$$

$$\begin{aligned}
 \text{Question:-} &= x \cdot (y + xz') \\
 &= x \cdot y + x \cdot (x \cdot z') \\
 &= xy + (x \cdot x) \cdot z' \\
 &= x \cdot y + x \cdot z' \\
 &= \boxed{x \cdot (y + z')}
 \end{aligned}$$

Question:-

$$\begin{aligned}
 &x \cdot y + y \cdot z + x \cdot z \\
 &\swarrow \\
 &\text{It's already Simplified}
 \end{aligned}$$

$$\begin{aligned}
 \text{Question:-} &= xy + (x+y) \\
 &= xy + xy \quad \therefore \overline{(x+y)} = x \cdot y \\
 &= (x \cdot y + x) \cdot (y \cdot x + y) \\
 &= x(y+1) \cdot y(x+1) \\
 &= x(1) \cdot y(x) \\
 &= x \cdot xy
 \end{aligned}$$

$$\begin{aligned}\text{Question:-} &= x \cdot yz + x + y + z \\ &= x(yz + 1) + y + z \\ &= x \cdot 1 + y + z \\ &= \boxed{x + y + z}\end{aligned}$$

$$\begin{aligned}\text{Question:-} &= ((x'y') \cdot (x'+y') + x'y'z) \\ &= (x'y') \cdot (x'+y') + x'y'z \\ &= x'y' + x'y'z \\ &= x'y'(1+z) \\ &= \boxed{x'y'z}\end{aligned}$$