

11.6

$$H(Y) + H(X, Y, Z) - H(X, Y) - H(Y, Z) = \sum_{x, y, z} p(x, y, z) \log (p(x, y)p(y, z)/p(y)p(x, y, z)) \quad (1)$$

$$\leq \frac{1}{\ln 2} \sum_{x, y, z} p(x, y, z) [1 - p(x, y)p(y, z)/p(y)p(x, y, z)] \quad (2)$$

$$= \frac{1 - 1}{\ln 2} = 0 \quad (3)$$

The equality occurs if and only if $p(x, y)p(y, z)/p(y)p(x, y, z) = 1$, which means a Markov chain condition of $Z \rightarrow Y \rightarrow X$, which is $p(x|y) = p(x|y, z)$

11.7**11.8****11.9****11.10****11.11****11.12****11.13****11.14****11.15****11.16****11.17****11.18****11.19****11.20****11.21****11.22****11.23****11.24**

11.25

11.26