

Problem 2

Tie sets:

$$T_1 = \{1\}$$

$$T_2 = \{5, 2\}$$

$$T_3 = \{4, 6\}$$

$$T_4 = \{2, 3, 4\}$$

$$T_5 = \{5, 3, 6\}$$

Cut sets

$$C_1 = \{1', 4', 5'\}$$

$$C_2 = \{1', 6', 2'\}$$

$$C_3 = \{1', 5', 6', 3'\}$$

$$C_4 = \{1', 2', 3', 4'\}$$

$$(1) R_{ab} = P_r \{T_1 \cup T_2 \cup T_3 \cup T_4 \cup T_5\}$$

$$\text{"sop"} = P_r \{T_1\} + P_r \{\bar{T}_1 T_2\} + P_r \{\bar{T}_1 \bar{T}_2 T_3\} + P_r \{\bar{T}_1 \bar{T}_2 \bar{T}_3 T_4\} + P_r \{\bar{T}_1 \bar{T}_2 \bar{T}_3 \bar{T}_4 T_5\}$$

$$= P_r \{1\} + P_r \{\bar{T}_1 T_2\} + P_r \{\bar{T}_1 \bar{T}_2 T_3\} + \dots$$

$$= P_r \{1\} + P_r \{\bar{T}_1 T_2\} + P_r \{\bar{T}_1 \bar{T}_2 T_3\} + \dots$$

$$= P_r \{1\} + P_r \{\bar{T}_1 T_2\} + P_r \{\bar{T}_1 \bar{T}_2 T_3\} + \dots$$

$$= p + q p^2 + q^2 p^2 + q^2 p^2 + \dots$$

$$= 0.997848$$

$$(2) R_{ab} = 1 - P_r \{C_1 \cup C_2 \cup C_3 \cup C_4\}$$