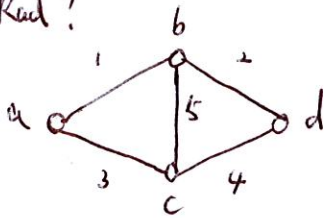


Find Rad?



Treesets:

$$T_1 = \{1, 2\} \quad T_2 = \{3, 4\} \quad T_3 = \{1, 5, 4\} \quad T_4 = \{3, 5, 2\}$$

cut sets

$$C_1 = \{1, 3\} \quad C_2 = \{2, 4\} \quad C_3 = \{1, 5, 4\} \quad C_4 = \{3, 5, 2\}$$

$$Rad = Pr \{T_1 \cup T_2 \cup T_3 \cup T_4\} \quad \text{or}$$

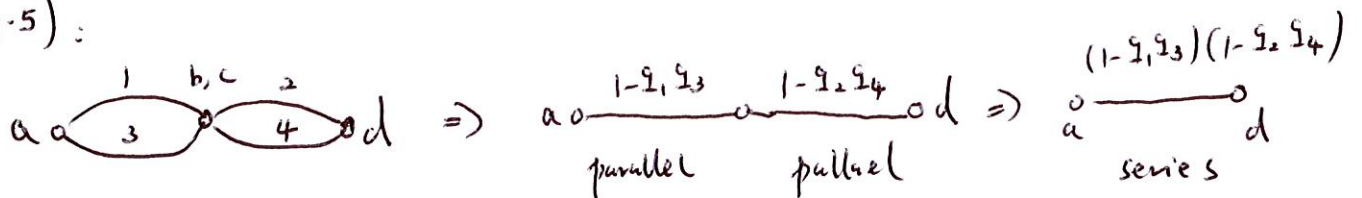
$$URad = 1 - Rad = Pr \{C_1 \cup C_2 \cup C_3 \cup C_4\}$$

I/E or sdp method must be applied to evaluate them! See an example solution next page.

★ Transformation Method:

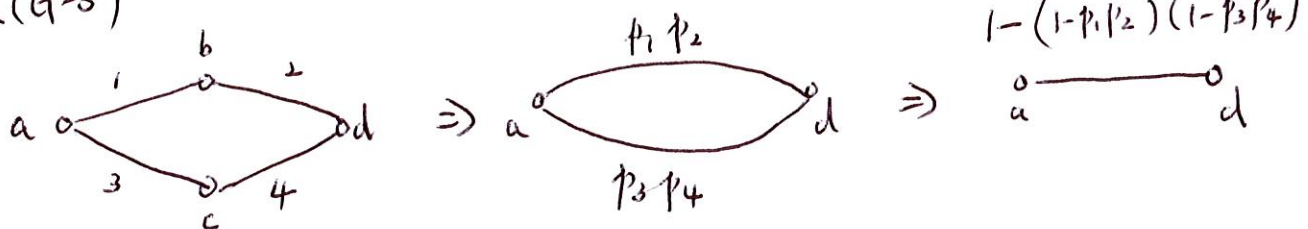
$$Rad = p_5 R(G \cdot 5) + (1 - p_5) R(G - 5) = p_5 R(G \cdot 5) + q_5 R(G - 5)$$

$R(G \cdot 5)$ :



$$\text{so, } R(G \cdot 5) = (1 - q_1 q_3)(1 - q_2 q_4)$$

$R(G - 5)$



$$\text{so, } R(G - 5) = 1 - (1 - p_1 p_2)(1 - p_3 p_4)$$

$$Rad = p_5 (1 - q_1 q_3)(1 - q_2 q_4) + q_5 [1 - (1 - p_1 p_2)(1 - p_3 p_4)]$$

$$p = 0.9$$

$$q = 0.1$$

$$= 0.88209 + 0.09639$$

$$= 0.97848$$

0.97848

Example

$$T_1 = \{1, 2\} \quad T_2 = \{3, 4\}$$

I/E based on tie sets (15 items)  $T_3 = \{1, 5, 4\}$   $T_4 = \{3, 5, 2\}$

$$Rad = P(T_1) + P(T_2) + P(T_3) + P(T_4) - P(T_1, T_2) - P(T_1, T_3) - P(T_1, T_4)$$

$$- P(T_2, T_3) - P(T_2, T_4) - P(T_3, T_4) + P(T_1, T_2, T_3) + P(T_1, T_2, T_4) + P(T_1, T_3, T_4)$$

$$+ P(T_2, T_3, T_4) - P(T_1, T_2, T_3, T_4)$$

$$= p^2 + p^2 + p^3 + p^3 - p^4 - p^4 - p^4 - p^4 - p^4 - p^5 + p^5 + p^5 + p^5 + p^5 - p^5$$

$$= 2p^2 + 2p^3 - 5p^4 + 2p^5$$

$$= 0.97848$$