

# Sketch of solutions to HW10

Chapter 6

Chapter 9

4. See the solution at the end of book.

5. (a) The minimal paths sets are  $\{1, 8\}$ ,  $\{1, 7, 9\}$ ,  $\{1, 3, 4, 9\}$ ,  $\{1, 3, 5, 6, 9\}$ ,  $\{2, 5, 6, 9\}$ ,  $\{2, 5, 6, 7, 8\}$ ,  $\{2, 4, 9\}$ ,  $\{2, 4, 7, 8\}$ ,  $\{2, 3, 7, 9\}$ ,  $\{2, 3, 8\}$ .

The minimal cut sets are  $\{1, 2\}$ ,  $\{2, 3, 7, 8\}$ ,  $\{1, 3, 4, 5\}$ ,  $\{1, 3, 4, 6\}$ ,  $\{1, 3, 7, 9\}$ ,  $\{4, 5, 7, 8\}$ ,  $\{4, 6, 7, 8\}$ ,  $\{8, 9\}$ .

(b) The minimal paths sets are  $\{6, 7\}$ ,  $\{6, 4, 2, 3\}$ ,  $\{6, 5, 3\}$ ,  $\{1, 4, 7\}$ ,  $\{1, 4, 5, 3\}$ ,  $\{1, 2, 3\}$ ,  $\{1, 2, 5, 7\}$ .

The minimal cut sets are  $\{1, 6\}$ ,  $\{2, 4, 6\}$ ,  $\{2, 5, 7\}$ ,  $\{3, 7\}$ ,  $\{6, 4, 5, 3\}$ ,  $\{1, 4, 5, 7\}$ .

6. See the solution at the end of book.

7.  $\{1, 4, 5\}$ ,  $\{3\}$ ,  $\{2, 5\}$ .

8. The minimal paths sets are  $\{1, 3, 5\}$ ,  $\{1, 3, 6\}$ ,  $\{2, 4, 5\}$ ,  $\{2, 4, 6\}$ .

The minimal cut sets are  $\{1, 2\}$ ,  $\{1, 4\}$ ,  $\{3, 2\}$ ,  $\{3, 4\}$ ,  $\{5, 6\}$ .

11.

$$\begin{aligned} r(p) &= P(\text{either } X_1X_3 = 1 \text{ or } X_2X_4 = 1)P(\text{either } X_5 = 1 \text{ or } X_6 = 1) \\ &= (p_1p_3 + p_2p_4 - p_1p_3p_2p_4)(p_5 + p_6 - p_5p_6) \end{aligned}$$

12. See the solution at the end of book.