Sketch of solutions to HW10

Chapter 6

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. 
\[
r(p) = P(\text{either } X_1X_3 = 1 \text{ or } X_2X_4 = 1)P(\text{either } X_5 = 1 \text{ or } X_6 = 1)
   = (p_1p_3 + p_2p_4 - p_1p_3p_2p_4)(p_5 + p_6 - p_5p_6)
\]

12. See the solution at the end of book.