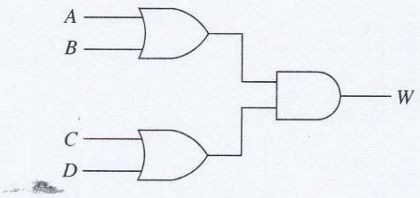
HW #3
ECT 213
Spring 2008

Name:_____

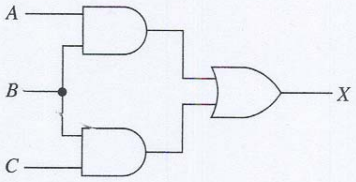
Due Tuesday JAN 31, 2008 (start of class).

Section 5–1

5–1. Write the Boolean equation for each of the logic circuits shown in Figure P5–1.



(a)



(b)

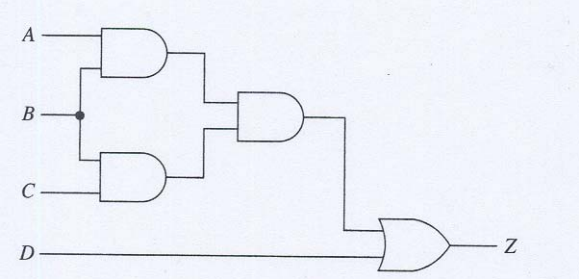
Section 5–2

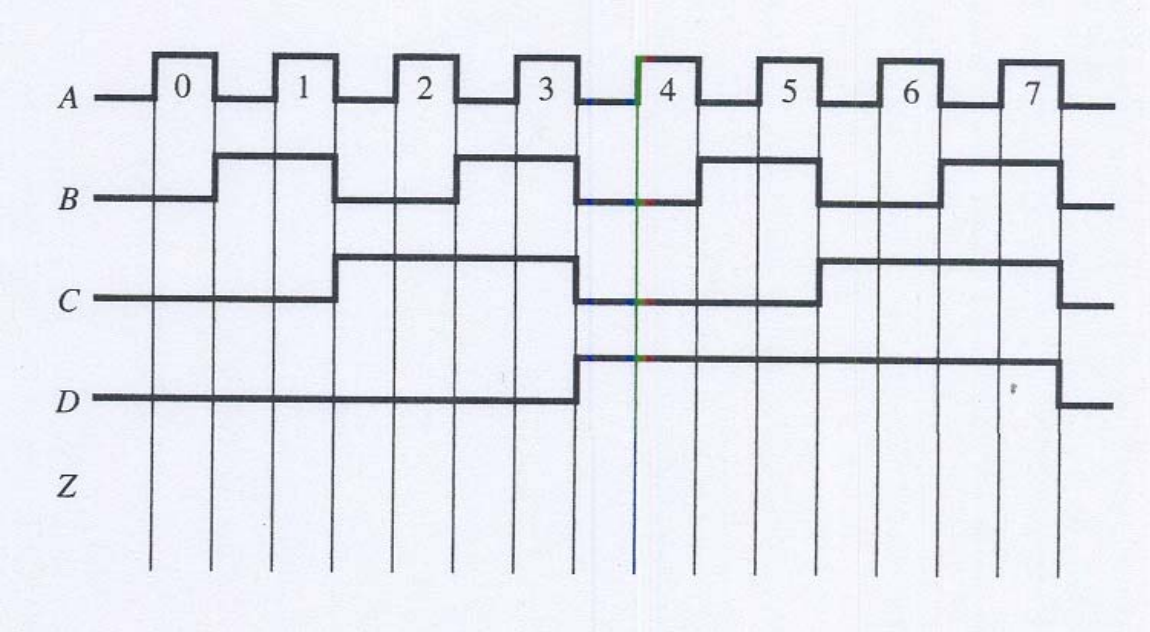
5–2. Draw the logic circuit that would be used to implement the following Boolean equations.

(c) $P = (AC + BC)(A + C)$

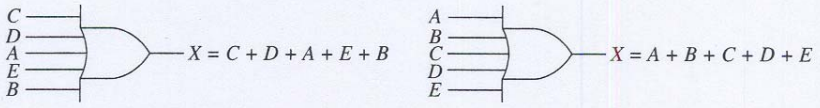
(d) $Q = (A + B)BCD$

5–4. Write the Boolean equation and then complete the timing diagram at *W*, *X*, *Y*, and *Z* for the logic circuits shown in Figure P5–4.



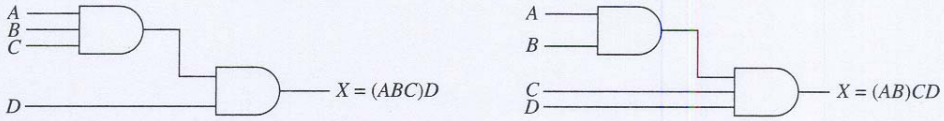


5–5. State the Boolean law that makes each of the equivalent circuits shown in Figure P5–5 valid.



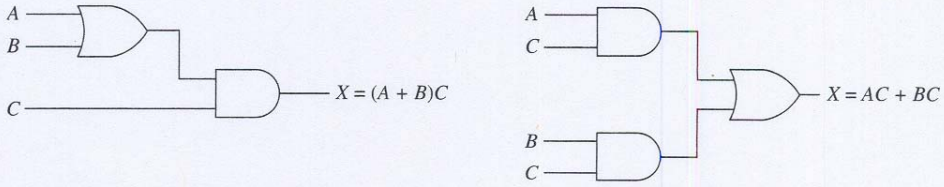
Original circuit Equivalent circuit

(a)



Original circuit Equivalent circuit

(b)



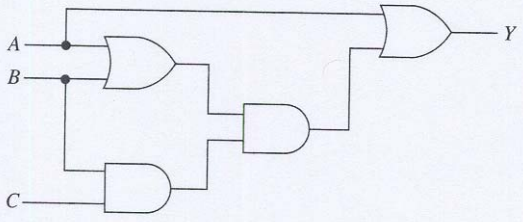
Original circuit Equivalent circuit

(c)

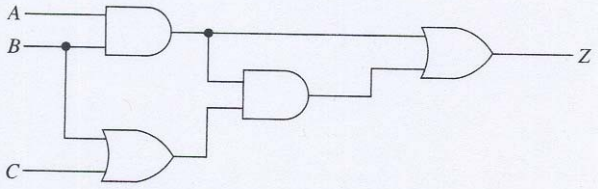
Section 5–3

5–7. Write the Boolean equation for the circuits of Figure P5–7. Simplify the equations, and draw the simplified logic circuit.

(a)



(c)



(c)

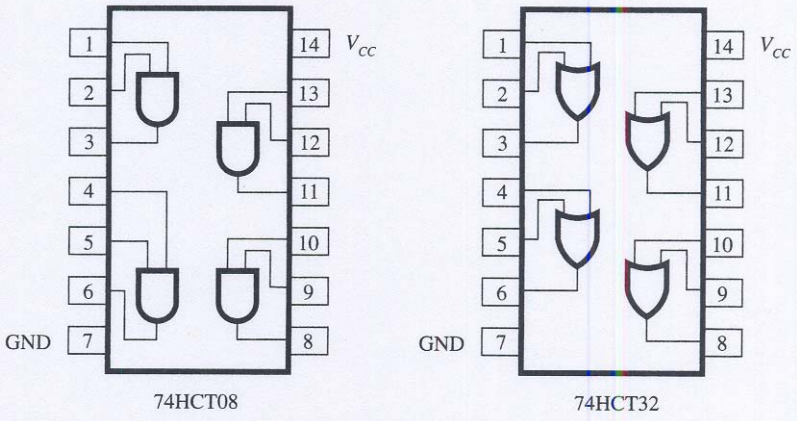
5–9. Draw the logic circuit for the following equations. Simplify the equations, and draw the simplified logic circuit.

(b) $W = (BCD + C)CD$

(e) $Z = ABC + CD + CDE$

5–11. The pin layouts for a 74HCT08 CMOS AND gate and a 74HCT32 CMOS OR gate are given in Figure P5–11. Make the external connections to the chips to implement the following logic equation. (Simplify the logic equation first.)

$$X = (A + B)(D + C) + ABD$$



5-17 Apply De Morgan's Theorem and Boolean algebra rules to reduce them to equations having inversion bars over single variables only. Draw the Simplified Circuit.

(d) $Z = \overline{AB + (\overline{A} + C)}$

(d) $Z = \overline{(C + D)\overline{A}\overline{C}D(\overline{A}C + \overline{D})}$

5–18. Write the Boolean equation for the circuits of Figure P5–18. Use De Morgan's theorem and Boolean algebra rules to simplify the equation. Draw the simplified circuit.