Digital Electronics
ECT 213

Test #1 Review

NOTE: The test will be based on the lectures, labs, home work and textbook chapters that have been covered to this point in the course. The guide below contains **EXAMPLES** of questions that could be on the test but does NOT cover EVERY TYPE OF QUESTION. Just because it is not included in this review guide does NOT exclude a question, or type of question, from being on the test!

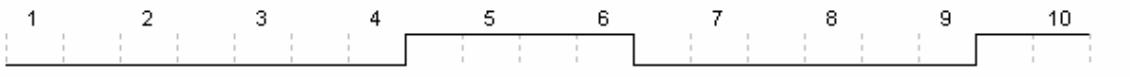
Chapter 1

1) What is the difference between an analog signal and a digital signal?
2) For TTL:
    a. What is the voltage minimum for a logic high?
    b. What is the voltage maximum for a logic low?
    c. What do we usually consider a High and LOW?
3) Conversions (similar table to HW) Show your work or no partial credit will be given.

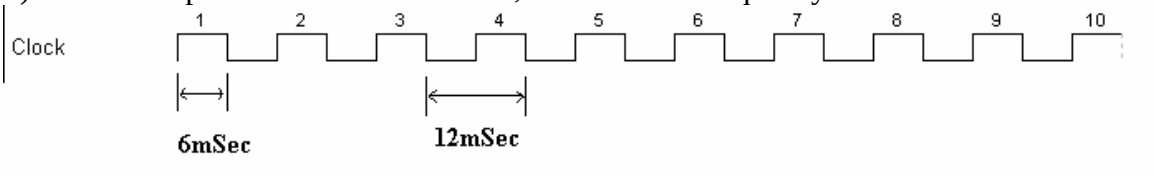
	a) Decimal	b) BCD	c) Hex	d) Octal	e) Binary
1	**178**				
2		**000101110101**			

Chapter 2

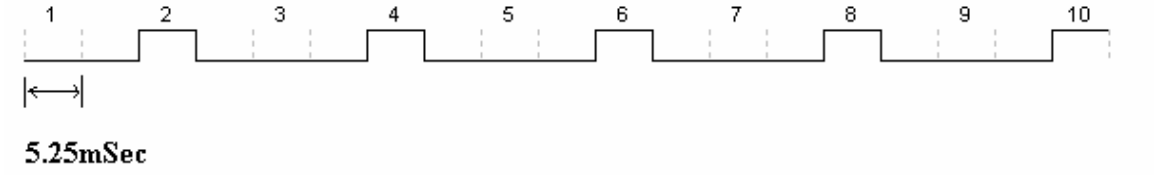
4) What is meant by "Discrete Levels"?
5) Draw the circuit needed to supply the correct input values to a digital logic circuit such that a closed switch will produce a LOGIC 0 and a open switch will produce a Logic 1.
6) On the waveform below, indicate the following:
    a. A rising edge
    b. A Falling edge
    c. High
    d. Low



7) What is the difference between a periodic and non-periodic waveform?
8) Given the periodic waveform below, calculate the frequency.



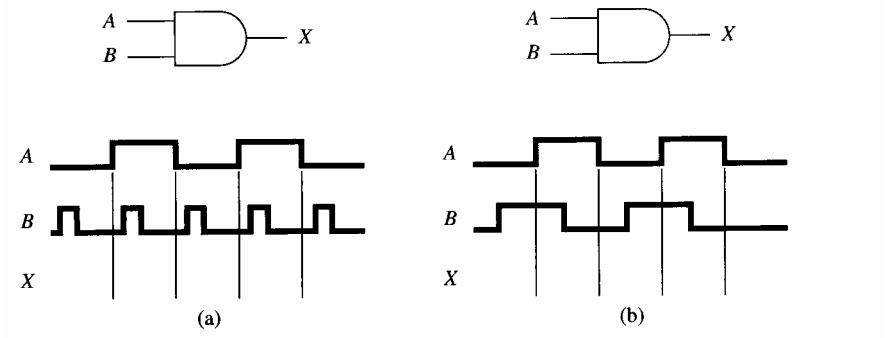
9) Given the waveform below, calculate the duty cycle.



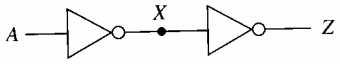
10) What does TTL stand for?
11) What is a logic probe?
12) What are the similarities and differences of a oscilloscope and a digital analyzer?
13) Given the IC below, indicate pin 1 and pin 9.

Chapter 3

14) **3–7.** Sketch the output waveform at *X* for the two-input AND gates shown in Figure P3–7.

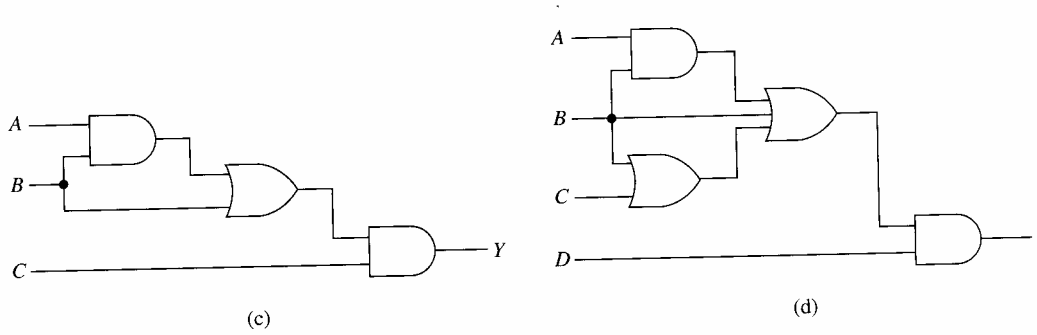
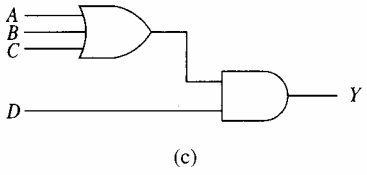


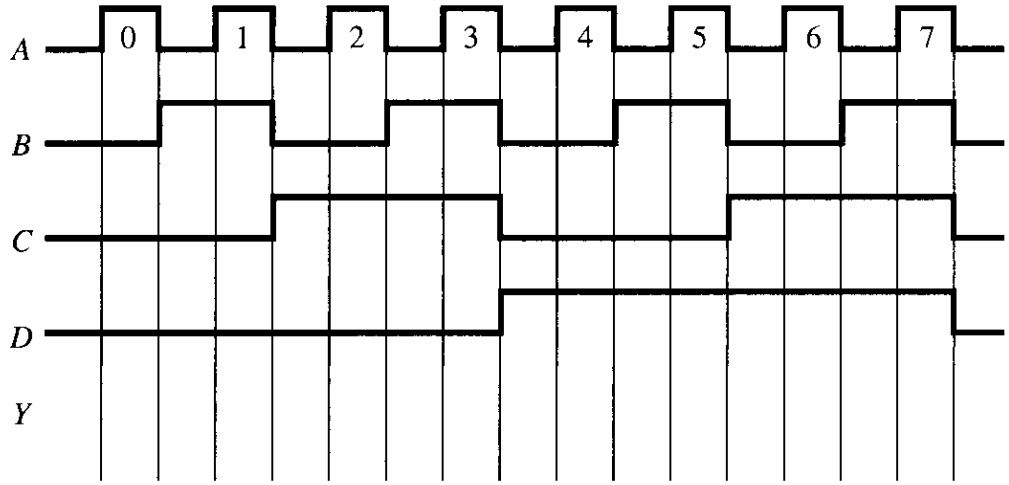
15) **3–26.** For Figure P3–26, write the Boolean equation at X and Z. If $A = 0$, what is X? What is Z?



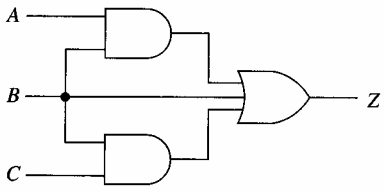
16) Create a truth table for a 2 input NOR gate.

Chapter 5

17)	Write the Boolean equation for the logic circuits shown 
18)	Draw the circuit for the given Boolean expression: $N = (A + B + C)D$
19)	Draw the circuit for the given Boolean expression: $S = B(A + C) + AC + D$
20)	Write the Boolean expression and complete the timing diagram for the circuit below: 



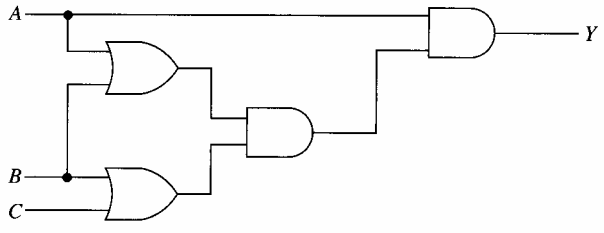
21) Write the Boolean expression for the following circuit, then simplify the equation and draw the simplified circuit.



(d)

22) Write the Boolean expression for the following circuit, then simplify the equation and draw the simplified circuit.

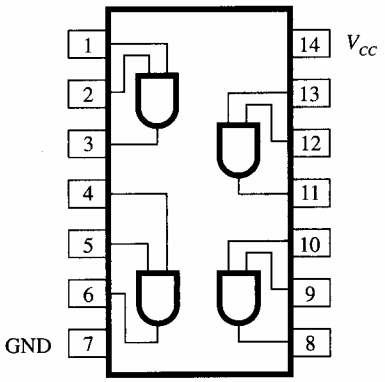
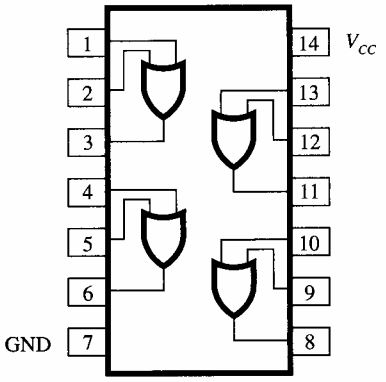
(a)



(b)

23) **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.)

$Y = AB(C + BD) + BD$

	 74HCT08  74HCT32
24)	Draw the circuit for the given Boolean expression, simplify and then draw the new circuit. $V = AC + ACD + CD$
25)	Draw the circuit for the given Boolean expression, simplify and then draw the new circuit. $X = (B + D)(A + C) + ABD$
26)	**5–17.** Draw the logic circuit for the following equations. 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. **(a)** $W = \overline{AB} + \overline{A + C}$ **(b)** $X = \overline{A\overline{B + C}} + \overline{BC}$ **(c)** $Y = \overline{(AB) + C} + B\overline{C}$ **(d)** $Z = \overline{AB + (\overline{A} + C)}$