BME/ISE 3511 Bioelectronics Test Four (Digital Electronics) Review Notes Fall 2014

Be familiar with the Boolean Algebra Properties and Theorems.

Be familiar with, knowledgeable of, and be able to solve problems associated with
- Logic Gates Switch Analogies (Page 1 of Digital Logic Gates Handout)
- Universal Capabilities of NAND Gates (Page 2 of Digital Logic Gates Handout)
- Bubble Pushing & Logic Identities (Page 3 of Digital Logic Gates Handout)

Prove DeMorgan's Theorem using truth tables.

Construct true tables for AND, OR, XOR, EQV, NAND, NOR gates.

Design AND, OR, NOR, XOR, and EQV gates using only NAND gates (simple inverters are okay as needed).

Use truth tables to show that $A \oplus B = A\overline{B} + \overline{A}B$

Use truth tables to show that $\overline{A \text{ XOR } B} = A \text{ EQV } B$

Use Boolean equations to show that three NOR gates can be configured to produce an equivalent AND gate.

Determine the Truth Tables for logic gate circuit diagrams (Digital Logic Gates Practice Problems #1).
Use True Tables and/or Boolean Algebra to simplify the logic gate implementation where possible.

Solve Logic Input/Output Problems (Digital Electron Quiz Problem #9).

Compare & contrast and list advantages & disadvantages of *serial* and *parallel* pulse trains.

Selected questions/problems from the following list of topics may be included on Test Four:
Diode-resistor and the transistor configurations for AND and OR gates

The following topics will NOT be covered on Test Four:
- Binary Number System
- Octal Number System
- Hexadecimal Number System
- Binary / Decimal Conversions
- Binary Arithmetic
- ASCII Codes, Grey Codes, Binary Coded Decimals
- Hamming Correction Codes
- Positive and Negative Logic