ee/cs120 june 14 7 pm ssc 235 double sided cheat sheet

bin to hex dec to bin

boolean algebra

circuit representation of logic functions

combinational logic

boolean algebra properties

complement

null elements

idempotent law

involution law

demorgan's law (very useful)

write algebraic equation

simplify equations

proofs: prove left = right

Convert boolean equation to a circuit of logic gates

Combinational logic

* Gates
* Memorize xor and xnor
* Adder
  + Sum = Xor
* Encoder, decoder
  + Encoder; inputs > outputs
  + decoder ; inputs < outputs
* Mux, demux
  + Mux: passthrough

Sequential logic

* Has memory (flip flop)
* Flip flops- 1 bit of memory; holds data for however many clock cycles
* D flip flops
  + What goes in comes out; D = Q
  + D is the next state of Q
* JK flip flops
  + Q\* = JQ’ +K’Q where Q = Q(t)

Adders and comparators

* Full adder:

Register

* Used for storing intermediate results
* Multiplication example; storing of partial products
* Get familiar with left and right shifting

Digital system Design

Clock design

* Period, critical path, frequency
* Timing diagram
* Lecture 8 slides 3-13 **VERY IMPORTANT**

State diagrams

* Current state, next state, output: table
* Convert to circuit and equation