JEE 2600 Fall 2018 Exam 1 Study Guide

Test 1 will cover chapters 1, 2, 3, and 4.1 - 4.8

Chapter 1:

- Binary and Hexadecimal number systems
  - Memorize the first 16 binary and hex values and their decimal equivalent.
  - Know how to convert between different number systems (i.e. binary to decimal or hexadecimal to binary)

Chapter 2:

- Know the basic gate types and how they work
  - Understand and be able to reconstruct their truth tables
  - Know their symbols
- Boolean Algebra
  - Know how to construct Boolean logic equations
  - Know how to use the theorems.
  - You do not need to memorize the theorems, they will be provided on the last page of the exam.
- Standard Forms
  - Truth tables
  - Canonical forms of equations
  - Know the difference between minterms & maxterms and how to use them.
  - Know how to convert between truth tables, equations and circuits.
- Multiple output circuits
  - Deriving truth tables, equations and circuits for designs with multiple outputs.
- Combinational logic design process – you are not responsible for optimizing equations.
- Decoders/Encoders and Muxes
- Propagation Delay

Chapter 3:

- Bit storage
  - Flip-Flops
  - Registers
- Clock signals & sequential timing
- Finite State Machines / State Diagram
- Controller / Sequential design process
- Reverse engineering circuits
- Determine maximum clock frequency

Chapter 4:

- Datapath sequential components – registers, multi-function registers.
- Datapath combinational components – Adders, comparators, multipliers, ALU, shifters
- Signed Numbers (signed magnitude, 1’s complement, 2’s complement)
- Addition & Subtraction
- Overflow

Note: This is not an exclusive list of topics to study, but a high level guideline.