Summary of Important Items to Understand
Chapter 2

1. Basic concepts of memory
   • Memory as a collection of storage devices
   • Word length
   • Concept of a memory address
   • Memory address space
   • Basic memory operations
     • Memory read
     • Memory write
   • Program memory
   • Data memory

2. Basic instruction cycle
   • Instruction address calculation
   • Instruction fetch
   • Operand address calculation
   • Operand fetch
   • Instruction execution
   • Result operand address calculation
   • Operand store

3. Details of the role of special-purpose registers
   • Program counter
   • Stack pointer
   • Memory address register
   • Memory data register
   • Instruction register

4. Instruction format
   • Operation code
   • Source operand
   • Result operand

5. Instruction classes
   • Data transfer
   • Arithmetic and logic
     • Logical shift instructions
     • Arithmetic shift instructions
     • Rotate instructions
   • Program sequencing and control
   • Input/output

6. Instruction representation and formats
   • Instruction mnemonics
   • Four address
   • Three address
   • Two address
• One address
• One and a half address
• Zero address
7. Addressing modes
• Immediate
• Absolute
• Indirect
• Register Direct
• Register Indirect
• Indexed
8. Branching
• Conditional branching
• Unconditional branching
• Condition code bits
9. Stacks
• First In First Out (FIFO)
• Last In First Out (LIFO)
• Push operation
• Pop operation
• Top of the stack
10. Subroutines
• Subroutine call
• Subroutine return
• Return address
• Subroutine nesting
11. Register transfer notation
12. Open-collector and tri-state devices
13. Logical (gate-level) implementation of registers
14. Interconnection of registers using tri-state devices and buses