

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