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CA1T2: Computer Organization

UNIT I: Number Systems And Computer Arithmetic - Signed and unsigned numbers, Addition and subtraction, multiplication, division, Floating point representation logical operation, Gray code, BCD codes, Error detecting codes. Boolean algebra, Simplification of Boolean expressions, K-Maps.

UNIT II: Combinational And Sequential Circuits- decoders, Encoders, Multiplexers, Half and Full adders, Shift registers; Sequential circuits- flip-flops.

UNIT III: Memory Organization-memory hierarchy, Main memory-RAM, ROM chips, Memory address map, memory contention to CPU; Associative Memory-Hardware logic, match, read and write logic; Cache Memory-Associative mapping, Direct mapping, set associative mapping, hit and miss ratio;

UNIT IV: Basic Cpu Organization-instruction formats-INTEL-8086 CPU architecture-Addressing modes - generation of physical address- code segment registers, Zero, one, two, and three address instructions.

UNIT V: Intel 8086 Assembly Language Instructions I -Data transfer instructions input- output instructions, address transfer, Flag transfer, arithmetic, logical, shift, and rotate instructions.

UNIT VI: Intel 8086 Assembly Language Instructions II - conditional and unconditional transfer, iteration control, interrupts and process control instructions, assembler directives. Programming with assembly language instructions.

UNIT VII: Micro Programmed Control - Control memory, Address sequencing, Microprogram example, design of control unit Hard wired control. Microprogrammed control

UNIT VIII: Input -Output Organization - peripheral devices, input-output interface-I/0 Bus and interface modules, I/O versus Memory bus, isolated versus memory mapped I/O, Modes of transfer-Programmed I/O, Interrupt-initiated I/O, priority interrupts-Daisy chaining, parallel priority, interrupt cycle, DMA- DMA control, DMA transfer, Input output processor-CPU-IOP communication.

Text Books:

1. Morris Mano -Computer System Architecture –3rd Edition-Pearson Education.
2. Microprocessors and Interfacing – Senthil Kumar, Sarvanan, Jevanathan and Shah, 1st edition, Oxford press, 2012.

References:

1. Computer Architecture and Organization – John P. Hayes, 3rd Edition, McGraw Hill, 1998.
2. Computer Systems Organization and Architecture, John D. Carpinelli, PEA, 2009
3. Computer Organization and Architecture,8/e, William Stallings , PEA,2010.
4. Douglas V.Hall Intel 8086-Programming- McGraw-Hill International studies.