

B.Sc. 301

Computer System Architecture

Unit I:

Von Neumann Machine (IAS Computer), Instruction codes, computer registers, computer instructions, timing and control, Instruction cycle, Memory Reference Instructions (AND, ADD, LDA, STA, BUN, BSA, ISZ), Microinstruction format, Symbolic microinstruction, Microprogram sequencer, Hardwired control vs Micro programmed control.

Unit II:

Central Processing Unit: General register organization, Control word, register stack, memory stack, Instruction format(zero address, one address, two address, three address instructions), Addressing modes, RISC vs. CISC.

Unit III

Input-Output Organization: Peripheral devices, I/O interface, Modes of Transfer, Priority Interrupt, Direct Memory Access, Input-Output Processor, and Serial Communication. I/O Controllers, Asynchronous data transfer, Strobe Control, Handshaking.

Unit IV

Memory Organization: Memory Hierarchy, Main memory (RAM/ROM chips), Auxiliary memory, Associative memory, Cache memory, Virtual Memory, Memory Management Hardware, hit/miss ratio, magnetic disk and its performance, magnetic Tape etc.

Unit V:

Process Organization: Basic Concept of 8-bit micro Processor (8085) and 16-bit Micro Processor (8086), Assembly Instruction Set, Assembly language program of (8085): Addition of two numbers, Subtraction, Block Transfer, find greatest number.

Pipelining: Parallel processing, Flynn's classification, space time diagram, speedup ration, Arithmetic pipeline, Instruction pipeline.

References:

1.Computer Organization and Design, 2nd Ed., by David A. Patterson and John L. Hennessy, Morgan 1997, Kauffmann.

2.Computer Architecture and Organization, 3rd Edi, by John P. Hayes, 1998, TMH.