Paper-II (MIT-102/MCA-202):Computer Architecture

Unit I Processor Basics

Processor Basics: CPU Organization: Fundamentals, additional features. Data representation: Basic formats, fixed point numbers, floating-point numbers. Instuction sets: Instruction formats, instruction types, programming considerations.

Unit II Datapath Design

Datapath Design: Fixed point arithmetic: Addition and subtraction, multiplication, division. Arithmetic Logic Unit: Combinational ALUs, sequential ALUs. Advanced topics: Floating-point arithmetic, pipeline processing.

Unit III Control Design

Control Design: Basic concepts: Introduction, hardwired control, design examples. Micro-programmed control: Basic concepts, multiplier control unit, CPU control unit. Pipeline control: Instruction pipelines, pipeline performance, super-scalar processing.

Unit IV Memory Organization

Memory Organization: Memory technology: Memory device characteristics, random-access memories, serial-access memories. Memory systems: Multilevel memories, address translation, memory allocation. Caches: Main features, address mapping, structure versus performance.

Unit V System Organization

System Organization: IO and System Control: Programmed IO, DMA and interrupts, IO processors. Parallel processing: Processor-level parallelism, multiprocessors.

Text Books:

1. J.P. Hayes: Computer Architecture and Organization, McGraw-Hill International editions.