AMSD09 COMPUTER ORGANIZATION

UNIT-1 INTRODUCTION

1.1 The Nature Of Computing, The Elements Of Computers, A Turing Machine To Add Two Unary Numbers, The Evolution Of Computers, Electronic Computers,

1.2 Organization of a First-Generation Computer, A Nonstandard Architecture: Stack Computers, The VLSI Era.

UNIT-2. BASIC ORGANIZATION AT THE COMPUTER

2.1 Logic gates, CPU organization

UNIT-3 ROLE OF OPERATING SYSTEMS AND COMPILERS

3.1 Opening remarks, what is an operating system, early history: the 1940s and the 1950s, the 1960s, the emergence of a new field: software engineering,

3.2 Distributed computing, the key architectural trend: parallel computation, input-output trends, open systems, Unix, ethical issues, application bases,

3.3 The key operating systems for the 1990s, compilers, target-language choice

UNIT-4 INSIDE A CPU

4.1 Data representation, fixed-point numbers, floating-point numbers, Number represented, instruction sets, instruction types, risc versus cisc,

4.2 Programming considerations, registers and storage, common bus system

UNIT-5 COMPUTER ARITHMETIC AND THEIR IMPLEMENTATION

5.1 Fixed-point arithmetic, multiplication, twos-complement multipliers, division, division by repeated multiplication, arithmetic logic units, combinational alus,

5.2 Controller design, introduction, hardwired control, microprogrammed control, the amd 2909 bit-sliced microprogram sequencer, Microinstruction addressing.

UNIT-6 MEMORY AND IO ACCESS

6.1 Ascii alphanumeric characters, input-output interface, i/o bus and interface modules, i/o versus memory bus, asynchronous data transfer, handshaking,

6.2 Asynchronous serial transfer, asynchronous communication interface, first-in, first-out buffer, modes of transfer, interrupt-initiated i/o, priority interrupt,

6.3 Daisy-chaining priority, priority encoder, interrupt cycle, software routines, initial and final operations, direct memory access (dma), dma controller, dma transfer,

6.4 Input-output processor (iop), keyboard devices, mouse, output devices, sequential and direct-access devices, magnetic disk, types of hard disks, optical disk, optical disk drive

UNIT-7 INSIDE THE MEMORY

7.1 Hierarchical Memory Technology, Random Access Memories (Rams), Bipolar Rams, Static Mos Rams, Dynamic Mos Rams, Inclusion, Coherence, And Locality,

7.2 Memory Capacity Planning, Virtual Memory Technology, Memory Replacement Policies, Cache Addressing Models, Direct Mapping And Associative Caches,
7.3 Set-Associative And Sector Caches, Cache Performance Issues

UNIT-8 INTRODUCTION TO PIPELINED OPERATION AND ARCHITECTURE

8.1 General Considerations, Instruction Execution Phases, Mechanisms For Instruction Pipelining, Branch Handling Techniques, Computer Arithmetic Principles,
8.2 Superscalar And Super pipeline Design, Superscalar Pipeline Design, Super pipelined Design, Supersymmetry And Design Tradeoffs, The Vliw Architecture,
8.3 Vector And Symbolic Processors, Pipelining Hazards

UNIT-9 INTRODUCTION TO MULTIPROGRAMMING AND MULTIPROCESSING

9.1 Characteristics of Multiprocessors, Interconnection Structures,
9.2 Parallel Processing, Multiprocessors, Cluster Computers

UNIT-10 NON VON NEUMANN ARCHITECTURES

10.1 Data flow computers, the genesis of data-flow, interpreting data-flow graphs,
10.2 Static and dynamic data-flow architectures, criticisms of data flow,
10.3 Reduction computer architectures, multiple instruction, single data (systolic architectures)

Reference Book:

1. Computer Science, Publisher Katsons, Writer M Ramaswamy