SYLLABUS
Programming For Problem Solving

Module - 1 :

(a) Introduction to Components of a Computer System :- Memory, Processor, I/O devices, Storage, Operating System, Concept of assembler, Compiler, interpreter & loader, linker.

(b) Idea of Algorithm : Representation of Algorithm, Flow Chart, Pseudocode with examples, from algorithm to programs, Source Code.

(c) Structure of C Programs : Writting & executing the I C Programs, Syntax & logical errors in Compilation, object and executable Code.

(d) Components of C language : Standard I/O in c, fundamentals data types, Variables and memory locations, Storage classes.

Module - 2 :

(a) Arithmetic expression & Precedence : Operators and expression using numeric & relational operators, Mixed operants, type Conversion, logical operators, Bit operations, assignment operator, operator presidence & associativity.

(b) Conditional Branching : Applying if an else with Statement, Nesting if and else & Use of break & default in Switch Statement.

Module - 3 :

(a) Interaction and loops : Use of While, Do While & for loops, Multiple loop Variables, Use of Break & Continue Statement.

(b) Function : Introduction, Types of functions, function with array, Passing parameters to function, Call by Value, Call by reference, Recursive function.

Module - 4 :

(a) Arrays : Array notation & representation, Manipulating array elements, Using multidimensional arrays, Character arrays & Strings, Structure, Union, Numerated data types, array Structures, Passing arrays to function.

(b) Basic Algorithms : Searching & Basics, Sorting algorithm (Bubble, insertion & Selection), finding routs of equation, notion of order of Complexity.

Module - 5 :

(a) Pointers : Introduction, Declaration, Application, Introduction to dynamic memory allocation (MALLOC, CALLOC, REALLOC, FREE), Use of pointers in Self-refrential

Structure, Notion of linked list (No implimentation).

(b) File Handling : File I/O function, Standard C
Preprocessor, defining & Calling Macros in c,
Command line arguments.

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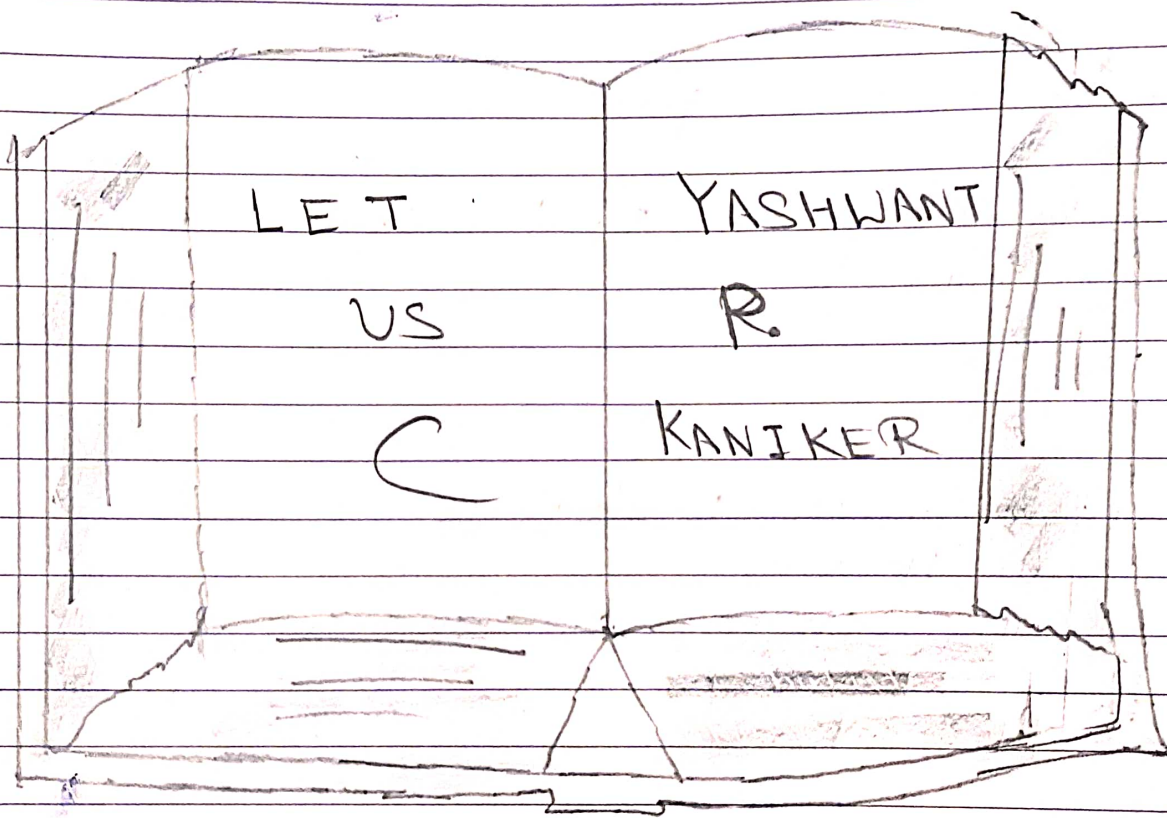
Introduction to Components of a Computer System :

Computer :- A Computer is an electronic device which takes data & instruction as input, Stores them, processes them & gives meaningful results as output Which Can also be termed as information.

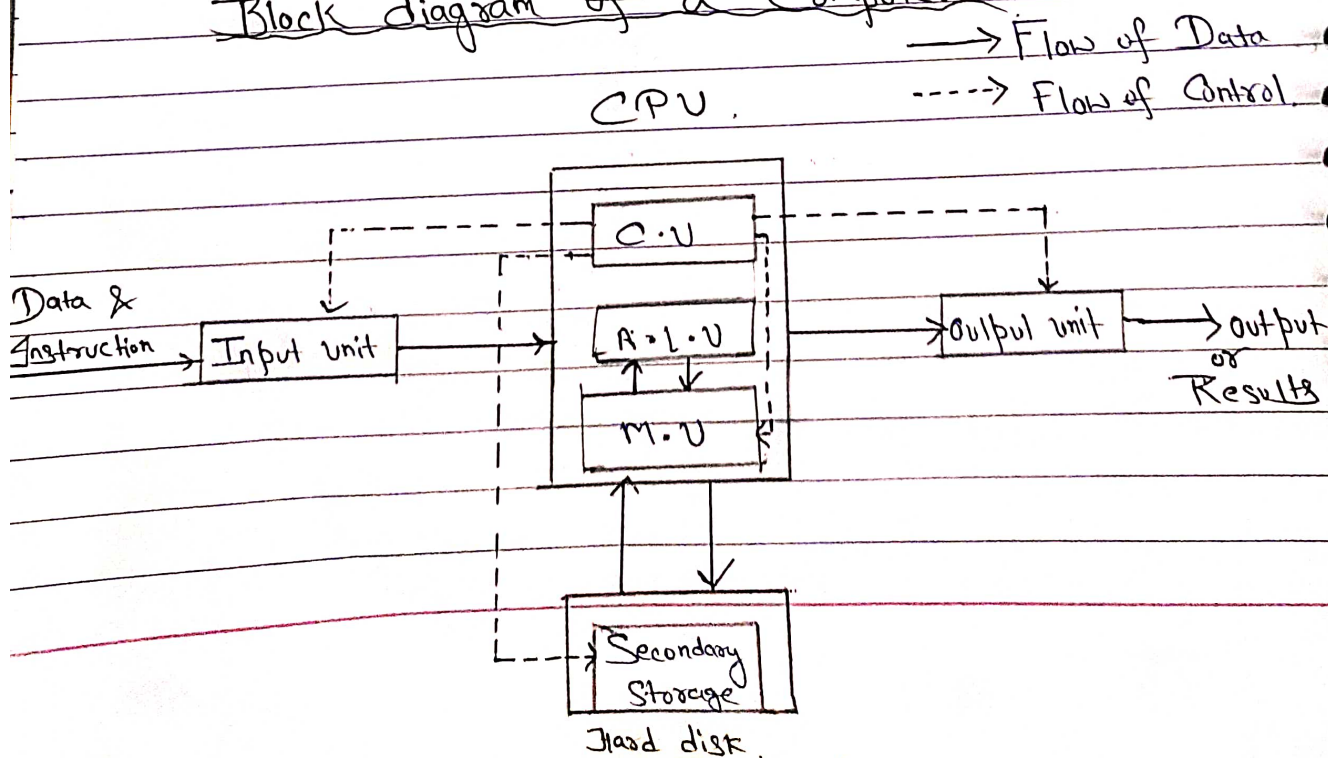Input → Store → Processing → Store → Output

Function of a Computer :

1. Storage
2. Processing
3. Output
4. Input

5. Controlling

Components of a Computer :
   (i) Hardware
   (ii) Software

Block diagram of a Computer.

        → Flow of Data
        ----→ Flow of Control

CPU.

Data & Instruction → Input Unit

CPU: C.U, A.L.U, M.U

→ Output unit → output or Results

Secondary Storage
Hard disk.

Central processing unit (CPU) :- It is called "the Brain of Computer" as it Controls operation of all parts of Computer. It Consist of three Components : Control unit (CU), Arithmetic logic unit (A.L.U), Memory Unit (M.U).

Control unit (CU) :- this part of CPU entracts instructions, Performs execution, maintains & directs operations of entire System.
It performs following function :
① Controls all activities of Computer.
② Supervises flow of data within CPU.
③ Directs flow of data within CPU.
④ Transfers data to arithmetic & logic unit.
⑤ Transfers results to memory.
⑥ Fetches results from memory to output devices.

Arithmetic logic unit (ALU) :- Data entered into Computer is Sent to RAM, from where it is then Sent to ALU, where rest of data processing takes place. All types of processing Such as Comparisons, decision making & processing of non-numeric information takes place here & once again data is moved to RAM.

Memory unit (MU) :- This is unit in which data & instructions given to Computer as well as results given by Computer are Stored.
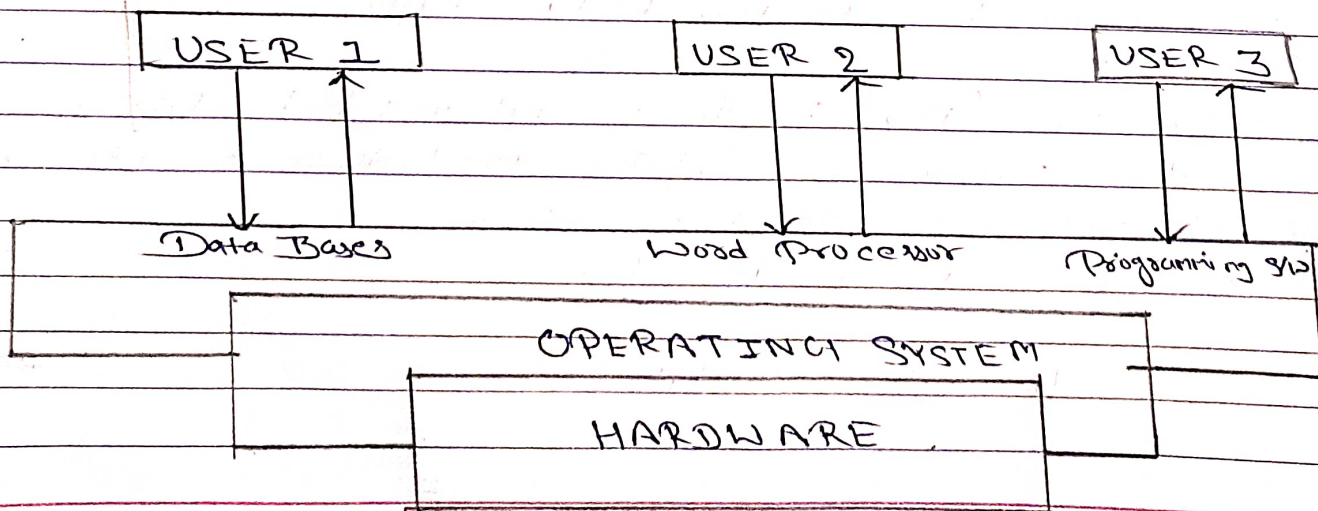   * Unit of memory is "Byte".

1 Byte = 8 Bits

A Modern Day Computer

Disk Controller

Device Controller

Graphics Adaptor

Processor

System Bus

MEMORY
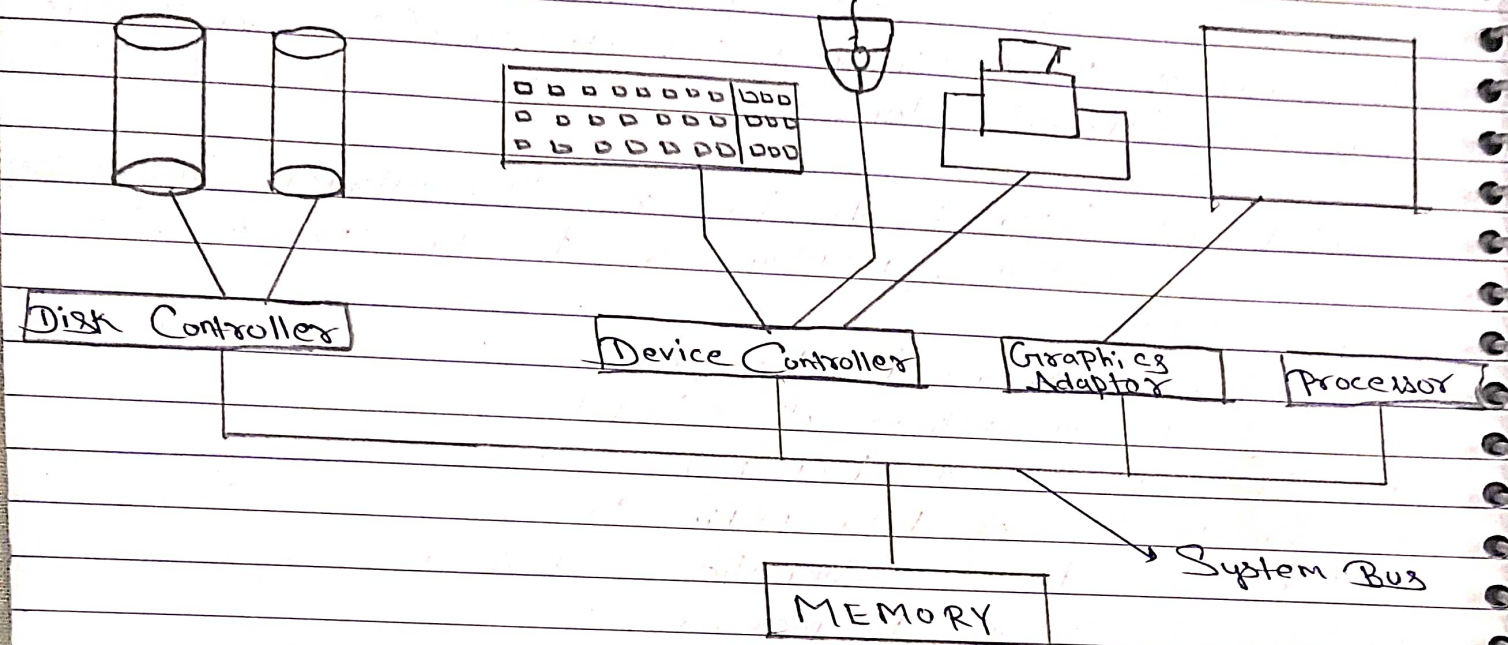
Components of Computer System :-

① Hardware
② Software
③ People / user
④ Data

USER 1

USER 2

USER 3

Data Bases

Word Processor

Programming s/w

OPERATING SYSTEM

HARDWARE

Data base → A database is an organized Collection of Structured information, or data typically Stored electronically in a Computer System.

Word Processor → A word processor is a type of Software application used for Composing, editing, formatting & Printing documents.

Programming Software → It is a Software which helps the programmer in developing other Software. Compilers, assemblers, debuggers, interpreters etc. are examples of programming Software.

Operating System → operating System is a Software that Controls System's hardware & interacts with user and application Software.