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AIM:- Introduction to Motherboard and it's components

Introduction:

A motherboard sometimes alternatively known as mainboard, system board or mobo is the main printed circuit board (PCB) found in computers and other expandable systems. It holds many of the crucial electronic components of the system, such as central processing unit (CPU) and memory and provides connectors for other peripherals as well

CPU socket :-

A CPU socket or CPU slot is a mechanical component(s) that provides mechanical and electrical connections between micro processor and printed circuit board (PCB). This allows the CPU to be replaced without soldering.

Common sockets have retention clips that apply a constant force, which must be overcome when a device is inserted. for chips with large numb -er of pins, either zero insertion force (ZIF) sockets or land grid array (LGA) sockets are used instead

Memory slots:-

A memory slot, memory socket or RAM slot is what allows computers memory (RAM) to be inserted into the computer. Depending upon the motherboard, there will be usually 2 to 4 memory slots (sometimes more than high-end motherboards) and are what determine the type of RAM used with the computer. The most common types of RAM are SDRAM and DDR for desktop computers and SO DIMM for laptop computers. each having various types and speeds. below picture shows how memory slots looks like in a computer. there are 3 open available slots for three memory sticks

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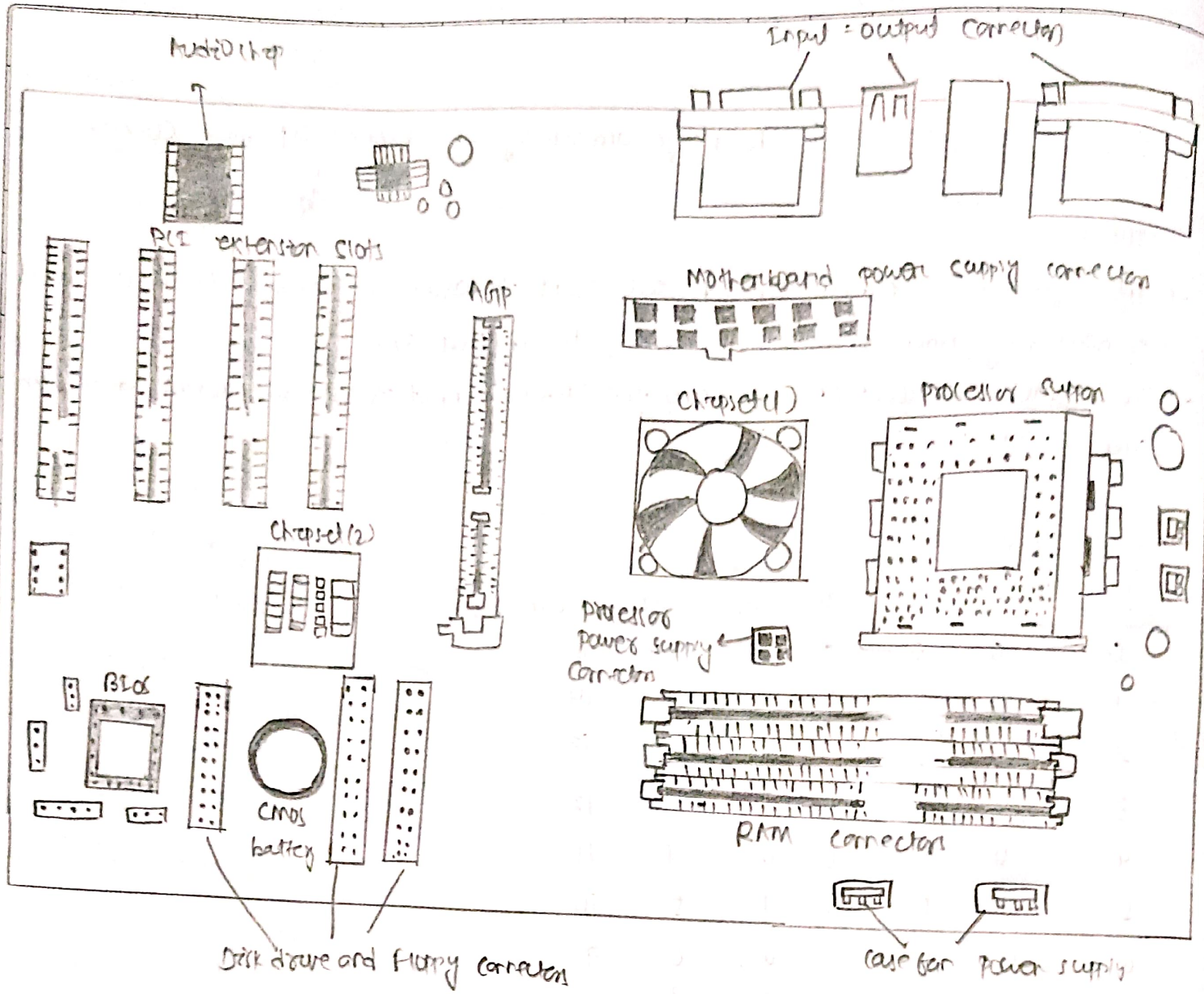
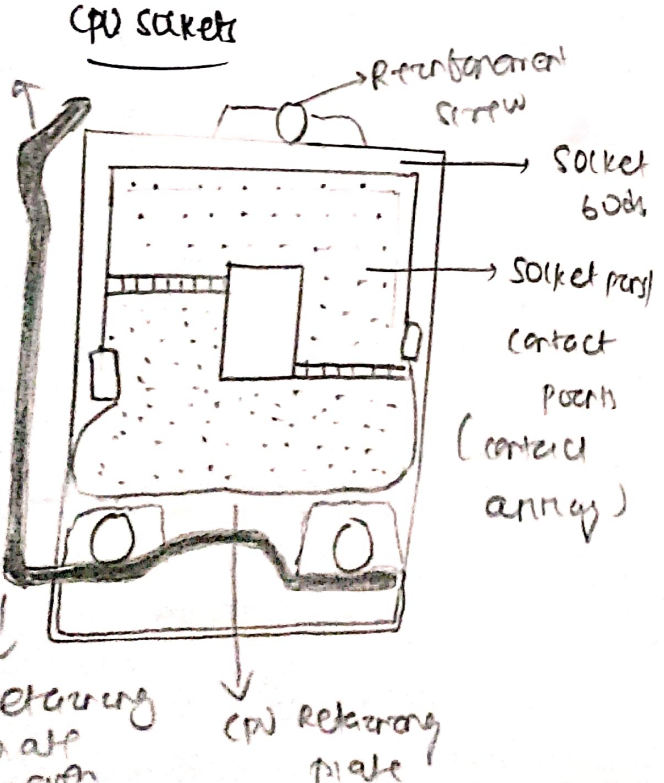
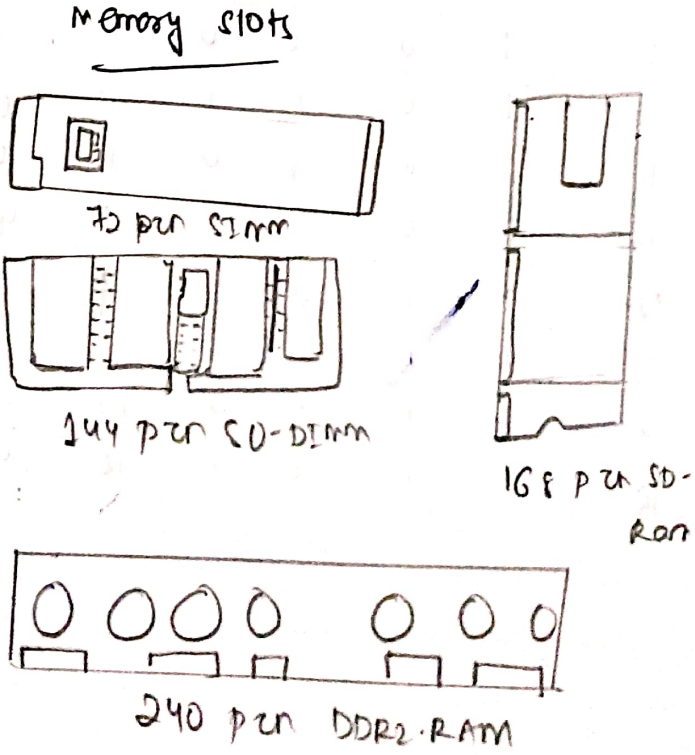

Input = output connection
Motherboard power supply connection
PCI extension slots
AGP
Chipset (1)
Chipset (2)
processor socket
processor power supply connection
BIOS
CMOS battery
RAM connector
Disk drive and Flopy connection
case fan power supply


CPU sockets
Retaining screw
Socket body
Socket pins (contact points (contact array))
Retaining plate lever
CPU retaining plate


Memory slots
72 pin SIMM
144 pin SO-DIMM
168 pin SD-RAM
240 pin DDR2 RAM

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CMOS Battery

Non-Volatile BIOS memory refers to a small memory on pc motherboard that is used to store BIOS settings. It was traditionally called CMOS Ram because it used a volatile, low-power complementary metal-oxide semi-conductor (CMOS) SRAM such as motorola MC14818 or similar) powered by a small battery when system power was off

ISA, PCI & AGP slots

ISA: On Industry standard Architecture, is an 8bit or 16 bit parallel bus system that allowed up to 6 devices to be connected to a pc. Virtually all IBM-compatible PCs made before pentium were based on the ISA (IBM's PC AT) bus. This asynchronous bus architecture uses 16-bit addresses and an 8-MHz clock and handles a maximum data throughput of 2 MB/s to 3MB/s

AGP: Accelerated Graphics port is a high-speed point-to-point channel for attaching a video card to a computers motherboard. The primary advantage of AGP over PCI is that it provides a dedicated pathway between the slot and the processor rather than sharing the PCI bus

PCI: peripheral component interconnection bus uses a local system, this system is independent of the processor bus speed. The PCI architecture incorporates its own chip set which link the local bus to the main bus, these links are called bridges. there are 2 bridges north and south bridges

CHIPSETS:

A Chipset is a set of electronic components in an integrated circuit that manages the data flow between the processor memory and peripherals. It is usually found in motherboard of a computer. Chipsets are usually designed to work with a specific family of microprocessors. because it controls communications between processor and electronic devices, the chipset plays an crucial role in determining system performance.

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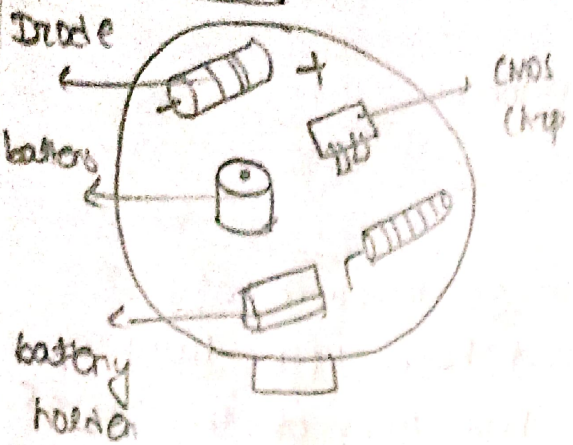
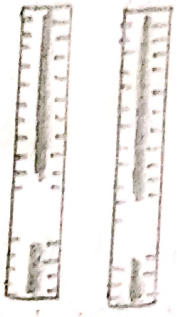
CMOS Battery



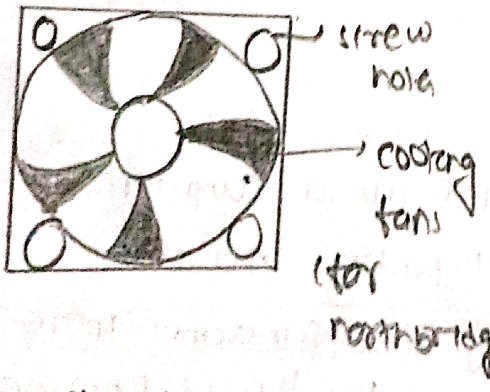
ISA slots

PCI slots

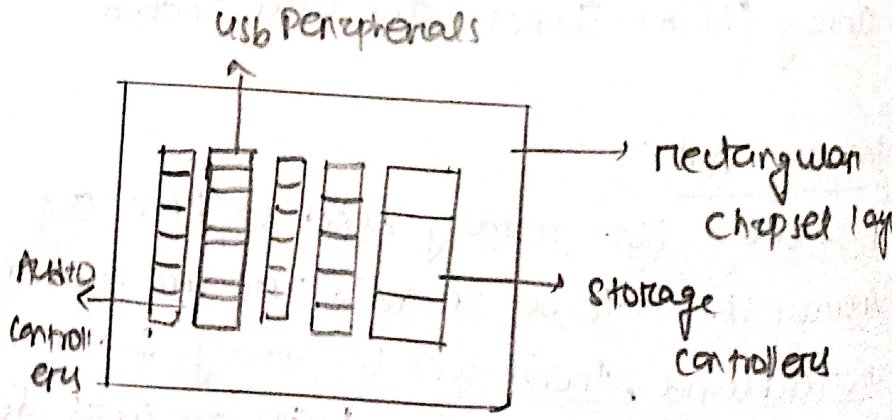


AGP slots

chipsets



Chipset 1



Chipset-2

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SouthBridge

South bridge is one of the two chips in the core logic chipset on a personal computer(pc) motherboard, the other being northbridge. The South bridge typically implements the slower capabilities of the motherboard in northbridge/southbridge chipset computer architecture

NorthBridge:

The northbridge typically co-handles communications among the CPU, in some cases RAM and PCI Express (on AGP) video cards, and the southbridge Some northbridge also contain integrated video controllers, also known as a Graphics and memory controller hub (GMCH) in intel systems. Because different processors and RAM require different signaling, a given northbridge will typically work with only one of two classes of CPU and generally one type of RAM

Graphical devices

A video card (also called a video adapter, display card and graphics card, graphics board and sometimes proceeded by the word discrete or dedicated to emphasise the distinction between this implementation and integrated graphic(s) is an example of expansion card which generates a feed of output images to a display (such as computer monitor)

ports

- USB (universal serial bus) :- A common type of port for connecting various devices
- PS/2: Older ports for keyboard and mouse
- Audio ports: For connecting speakers and microphones

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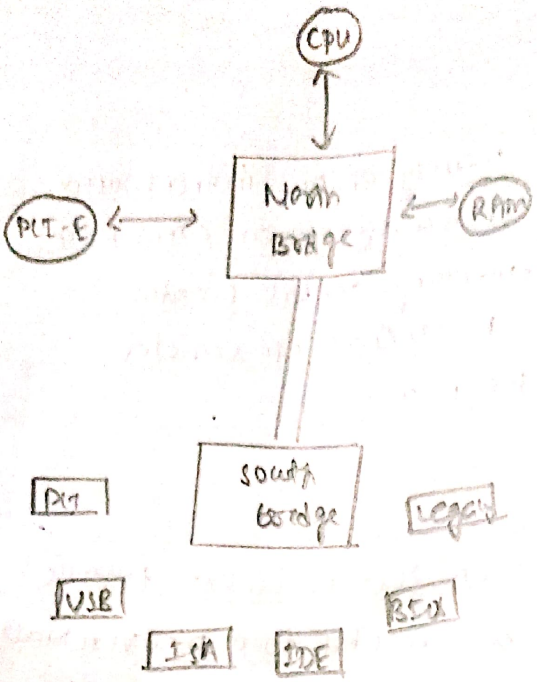
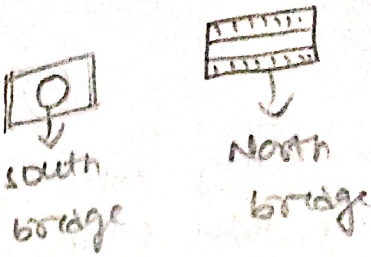
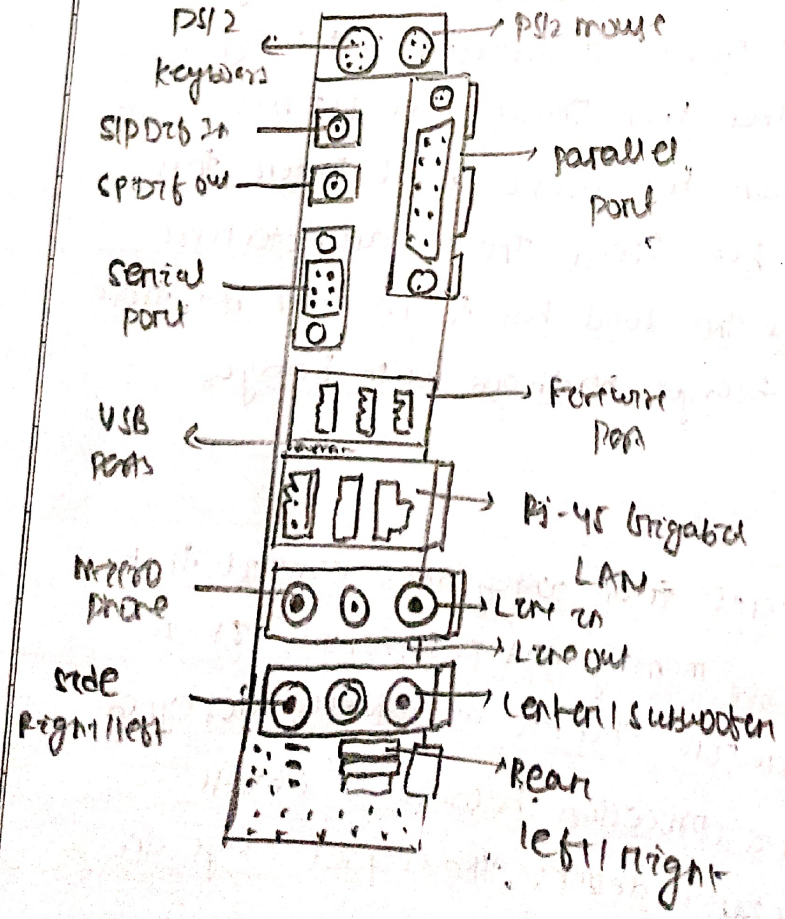




North bridge and south bridge

Back panel connector and ports



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Other components

BIOS:- BIOS is a program that starts the computer system when it's powered on and manages the data flow between operating systems and other attached devices including floppy drives

Disk Drive and Floppy connectors: The 34-pin floppy drive connector also known as FDD connector is a interface used to connect floppy disk drives to the mother board

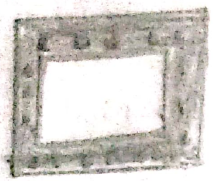
Cooling fan/heatsinks: used to dissipate heat generated by the CPU and other components

Connectors for internal devices: Connect hard drives, SSDs and optical drives

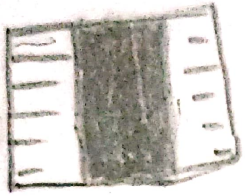
I/O chips: manages input/output functions

Audio chips: handles audio processing

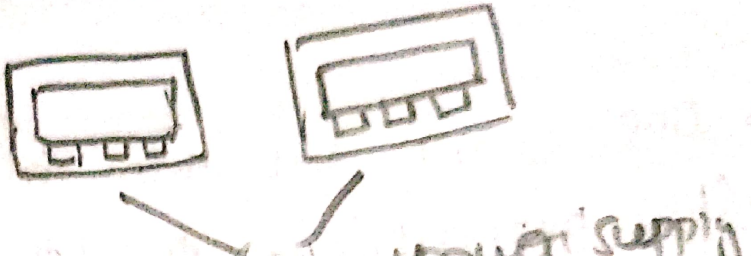
Signature



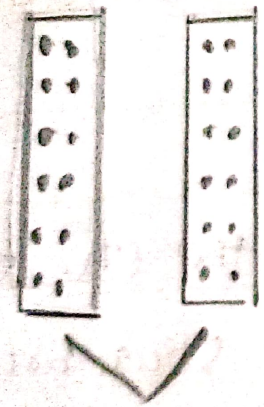
BIOS



Audio (high)



Case fan/Power supply



Disk drive/floppy connectors