Lecture-2:

The Microprocessor-based personal computer system:

**Microcomputer Block Diagram**

The block diagram of a microprocessor-based computer system (the CPU is the microprocessor)

Fig. (a)

The above figure shows the block diagram of a microprocessor based personal computer system. The block diagram comprises of blocks-memory system, microprocessor(CPU) and I/O peripheral devices, which are interconnected by the buses. A bus is a set of common connections that carry the same type of information. There are 3 types of buses – Address bus, Data bus and Control bus in a computer system.

The memory structure remains same for all the Intel 80x86 through Pentium IV personal computer systems. Fig (b) illustrates the memory map of a personal computer system. The memory system is divided into three main parts:

- Transient Program Area (TPA) – 640 Kbytes.
- System Area – 384 Kbytes.
- Extended Memory system (XMS) – amount of memory depends on the microprocessor used in the personal computer system.
The Microprocessor:

The microprocessor is the heart of the microprocessor-based computer system. Microprocessor is the controlling element and is sometimes referred to as the Central Processing Unit (CPU). The microprocessor controls memory and I/O through a series of connections called buses. The microprocessor performs three main tasks for the computer system:

- Data transfer between itself and the memory or I/O systems.
- Simple arithmetic and logic operations, and
- Program flow via simple decisions.

8086 is a 40 pin DIP using MOS technology. It has 2 GND's as circuit complexity demands a large amount of current flowing through the circuits, and multiple grounds help in dissipating the accumulated heat etc. 8086 works on two modes of operation namely, Maximum Mode and Minimum Mode.

**Fig (b):** The memory map of the personal computer