**Chapter 1 - History of Computers**

**Overview Organisation and Architecture**

* **Computer architecture** is the attributes of a system visible to a programmer or attributes that have direct impact on the logical execution of a program.
* **Computer instruction** refers to the software side.
* **Computer organization** refers to the operational units and their interconnections that realize the architecture specifications.

**Structure and Function**

* **Structure** – Way in which the components are interrelated.
  + There are four main structural components:
    - Central processing unit (CPU)
    - Main memory
    - I/O
    - CPU interconnections
* **Function** – Operation of each individual component as part of the structure.
  + The basic functions a computer can perform which are:
    - **Data processing** – processing of data.
    - **Data storage** – storing of data in short and long term means.
* **Data movement** – move data between itself and the outside world. Long distance movement of data is known as data communications.
* **Control** – is exercised by the individual(s) who provides the computer with instructions.

**A Brief History of Computer**

**First Generation – Vacuum Tubes**

* **ENIAC** (Electronic Numerical Integrator and Computer) was developed to solve the difficulty of supplying tables accurately and within a reasonable time frame.

**Von Neumann Machine**

* In 1946, von Neumann and his colleague began the design of a new stored-program computer, referred to as IAS (Institute for Advanced Study) computer.
* The general structure of IAS consist of:
* Main Memory
* Arithmetic and Logic Unit (ALU)
* Control Unit
* Input and Output

**Commercial computers**

* As time progresses, UNIVAC1 was the first successful commercial computers intended for scientific and commercial applications.
* The system listed matrix algebraic, statistic life insurance billing and logistic computations.

**Second Generation – Transistors**

* Transistors replaced vacuum tubes.
* Transistors is smaller, cheaper and dissipates less heat.
* It is a solid state device made from silicon.
* It was invented by Bell Lab in 1947.

**Third Generation – Integrated Circuits**

* In 1958, microelectronics were invented on integrated circuits. E.g., IBM System/360, DEC PDP-8
* Integrated circuits exploits the fact that transistors, resistors and conductors can be fabricated from a semiconductor such as silicon.

**Later Generations**

* 4th and 5th generation are based on advances in integrated circuit technology.
* With the introduction of large-scale integration (LSI), more than 1000 components can be placed on a single integrated circuit chip.

**PENTIUM and POWER PC EVOLUTION**

* Pentium results from decades of design effort on Complex Instruction Set Computers (CICS).
* It incorporates the sophisticated design found in mainframes and minicomputers.
* PowerPC is descendent of Reduced Instruction Set Computers (RISC) system. E.g., IBM 801