1.1 Describe briefly the significant development in microprocessor technology.

Ans: Generation of Microprocessor

1st Generation: This was the period during 1971 to 1973 of microprocessor’s history. In 1971, INTEL created the first microprocessor 4004 that would run at a clock speed of 108 KHz. During this period, the other microprocessors in the market including Rockwell international PPS-4, INTEL-8008 and National semiconductors IMP-16 were in use. But, all these were not TTL compatible processors.

2nd Generation: This was the period during 1973 to 1978 in which very efficient 8-bit microprocessors were implemented like Motorola 6800 and 6801, INTEL-8085 and Zilogs-Z80, which were among the most popular ones. Owing to their superfast speed, they were costly as they were based on NMOS technology fabrication.

3rd Generation: During this period 16 bit processors were created and designed using HMOS technology. From 1979 to 1980, INTEL 8086/80186/80286 and Motorola 68000 and 68010 were developed. Speeds of those processors were four times better than the 2nd generation processors.

4th Generation: From 1981 to 1995 this generation developed 32 bit microprocessors by using HCMOS fabrication. INTEL-80386 and Motorola’s 68020/68030 were the popular processors.

5th Generation: From 1995 to until now this generation has been bringing out high-performance and high-speed processors that make use of 64-bit processors. Such processors include Pentium, Celeron, Dual and Quad core processors.

Thus, microprocessor has evolved through all these generations, and the fifth generation microprocessors represent advancement in specifications. Therefore, some of the processors from the fifth generation of processors with their specifications are briefly explained below.

Intel Celeron

Intel Celeron is introduced in April 1998. It refers to a range of Intel’s X86 CPUs for value personal computers. It is based on Pentium 2 and can run on all IA-32 computer programs.

From the year 2000 to up to now, here is a brief history of Intel Celeron processors.

The year 2000 marked the introduction of the following processors:
- Jan 4-Intel Celeron Processor (533MHz)
- Feb14-Mobile Intel Celeron Processor (450, 500 MHz)
- June19-Low Voltage Mobile Intel Celeron Processor (500 MHz)

The year 2001 marked the introduction of the following processors:
- Jan 3-Intel Celeron Processor (800 MHz)
- Oct 2-Intel Celeron processor (1.2 GHz)

The year 2002 marked the introduction of the following processors:
- Jan 3: Intel Celeron Processor (1.30 GHz)
- Nov 20: Intel Celeron Processor (2.10, 2.20 GHz)

The year 2002 marked the introduction of the following processors:
- Jan 14: Mobile Intel Celeron processor (2 GHz)
- Low Voltage Mobile Intel Celeron Processor (866 MHz)
- Nov 12: Mobile Intel Celeron Processor (2.0GHz)
- Ultra-Low Voltage Mobile Intel Celeron Processor (800 MHz)

The year 2004-2007 marked the introduction of the following processors:
- Jan4, 2004: Intel Celeron M processor 320 and 310 (1.3, 1.2 GHz)
- July 20, 2004: Intel Celeron M processor Ultra Low voltage 350-1.00 MHz
- March- Intel Celeron M processor 430-450 (1.73-2.0 GHz)
- Nov 23: Intel Celeron D Processor 345 (3.06 GHz)

The year 2008 marked the introduction of the following processor:
- Jan 2008 Celeron Core 2 DUO (Allendale)

Pentium

Pentium was introduced on March 2, in 1993. Pentium succeeded the Intel 486; The 4 indicates the fourth generation micro architecture in the microprocessor’s history. Pentium refers to an Intel’s single core x 86 microprocessor, which is based on the fifth generation micro-architecture. This processor’s name was derived from the Greek word penta, means five.

The original Pentium processor was succeeded by the Pentium MMX in 1996. This processor has a data bus of 64 bits. A standard single transfer cycle can read or write up to 64 bits at a time. The Burst read and writes back cycles are supported by the Pentium processors. These cycles are used for cache operations and transfer 32 bytes (size of the Pentium cache line) in 4 clocks. All cache operations are burst cycles for the Pentium.

The year 2000 marked the introduction of the following processors:
- March 20: Intel Pentium III processor (866, 850MHz)