MM ASSIGNMENT

Done By,
Harikrishnan.V
CS5A
Roll No: 27

Microcontroller

→ It is an integrated circuit that is programmed to do a specific task. It is basically a computer on a chip.

→ It is designed and used for small and dedicated applications.

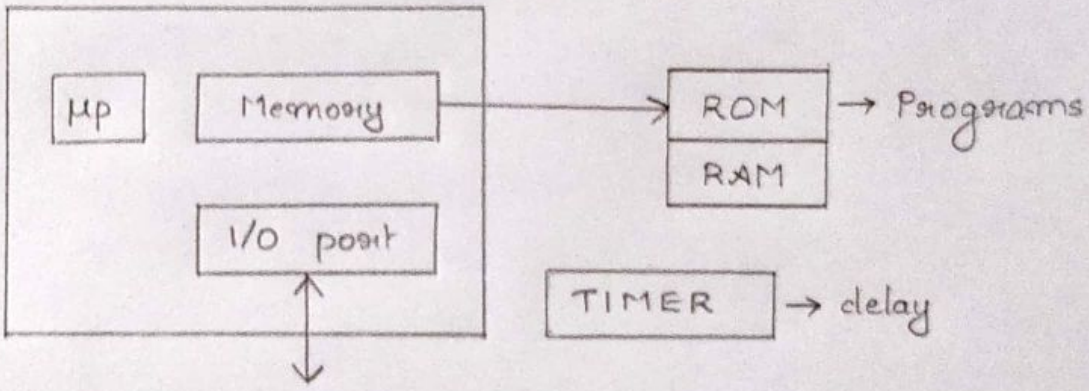
→ It incorporates not only ALU & CU, but also memory and I/O ports

→ The programs are written permanently in ROM.

→ Input is given by the user & it is stored in RAM.

→ Microcontroller is present in mouse, keyboard, remote, A/C, TV etc.

→ In microprocessor, we can change the program. But it is not possible in microcontroller.



Features of Microcontroller

(i) Bus width → 4 bit, 8 bit, 16 bit, 32 bit

(ii) Memory size → 8051 has 128 byte RAM & 4kb ROM.
→ 8052 has 256 byte RAM & 8kb ROM.
→ MOTOROLA's 68HC11 has 256 byte RAM & 8kb ROM
→ INDISE 8031 has no ROM.

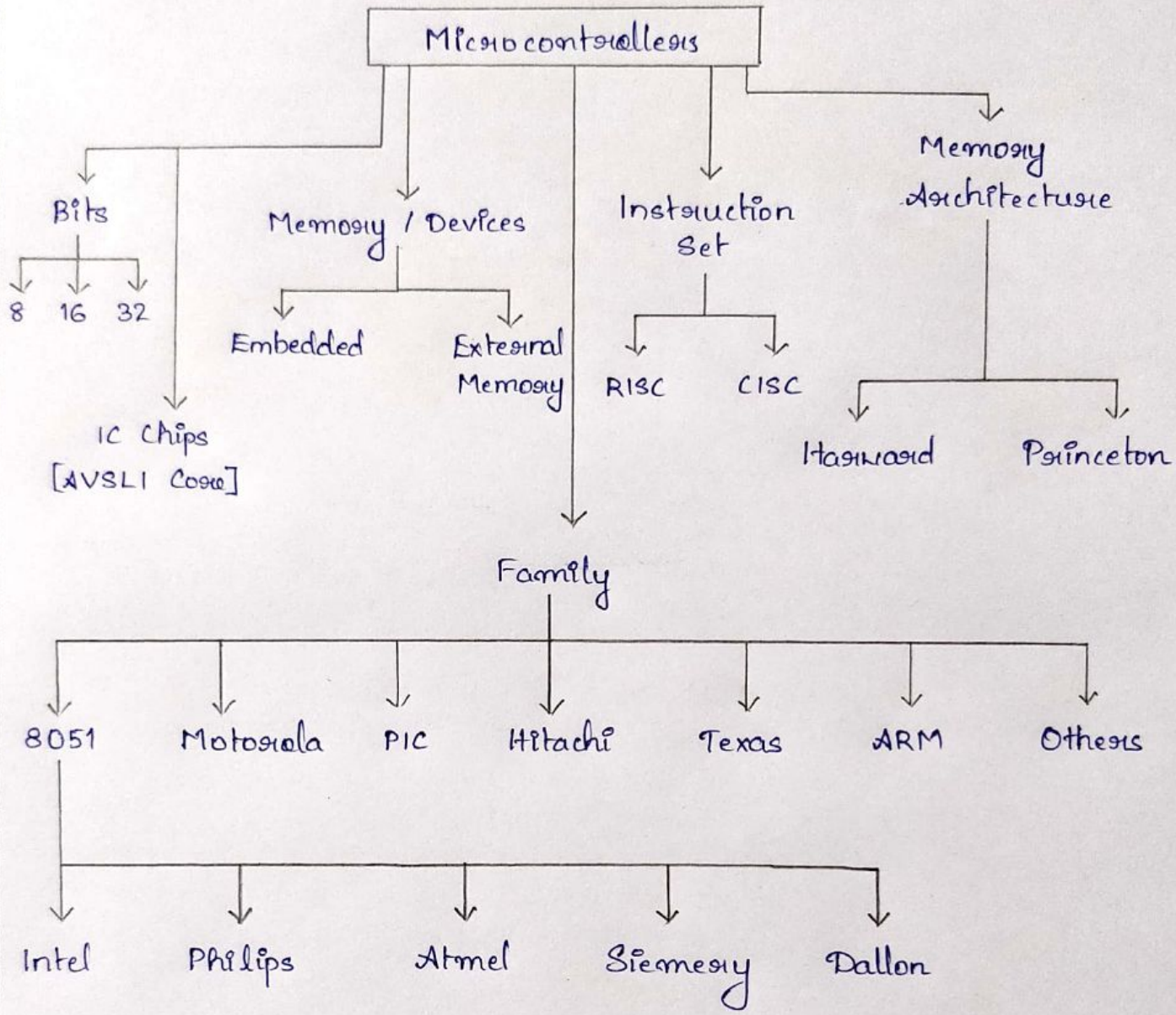
(iii) Instructions → Complex Instruction Set Computer (CISC)
→ Reduced Instruction Set Computer (RISC)

(iv) Number of built-in peripherals → 8051 has 4 I/O ports & 2 counters.

(v) Memory architecture → Von neumann & Harvard architecture.

(vi) Speed.

Types of Microcontrollers



Criteria for Selecting a Microcontroller

Selection of the right microcontroller for an application is the most important part of the system design. First of all the system designer has to clearly determine the role of the microcontroller in his design.

Then he has to begin a search for the microcontroller that will meet his requirements. This is done by referring to books & data sheets.

Factors that should be taken into consideration are:

→ Meeting the computing needs of the task at hand efficiently & cost effectively

→ Availability of system development tools such as compilers, assemblers & debuggers.

→ Wide availability & reliable source of microcontroller.

Criteria for selecting a microprocessor are:

(i) Bus width

(ii) Memory size

(iii) Number of bits in peripherals

(iv) Speed

(v) Power consumption

(vi) Package type

(vii) Quantity required (Manufacturing cost)

(viii) Development support

(ix) Availability.

Example Applications

1. General

(i) Electronic weighing machine
(ii) pH meter
(iii) Proximity detectors
(iv) Intensity analyzer
(v) Data acquisition system

2. Biomedical

(i) ECG recorder
(ii) Patient monitoring system
(iii) Blood cell counter
(iv) Radiation therapy system
(v) Physio therapy system

3. Handheld Instruments

(i) Sugar analyzer
(ii) Pressure measurement
(iii) Magnetic field detection
(iv) Target distance finder
(v) Moisture meter
(vi) AC control

4. Communication

(i) Set top box
(ii) Switches
(iii) Hubs
(iv) Routers
(v) Signal tracker

(vi) Cable TV
(vii) Target trackers
(viii) Signal polarization
(ix) Infrared remote sensing

5. Controllers
(i) Robot control
(ii) CNC machine control
(iii) Realtime control
(iv) Peripheral controllers
(v) Printer controllers
(vi) USB port controllers
(vii) CRT display controllers
(viii) Disc drive controllers