

(A)

Micro-processor : It is an IC which contains only CPU on it, it doesn't have ROM or RAM. Unlike Micro-controllers.

Micro-controller : It is an IC which is used for single purpose, it contains peripherals, ROM and RAM as well as the CPU.

Embedded systems : It is a combination of computer hardware and software for specific design.

Mechatronic System : It is a combination of studying the science of Electrical and mechanical and computer science technology.

n-bit processor : Number of bit data which can be processed by CPU simultaneously.

Q2)

Micro processor

- Contains only Cpu on it
- Work on Von-Neuman arch
- Has No RAM and No ROM

Micro - Controller

- Has RAM and ROM with peripherals.
- Works on Harvard Architecture
- Single purpose.

Q3)

Von-Neuman Architecture

Data and instructions are shared on the same memory and transaction with Cpu by one bus. it is not used in Micro - Controllers

Harvard - Architecture

Data and Instructions are separated in different memories with different buses

Types of ROM

- 1) PROM :- It is a programmable memory can be programmed by the user.
 - it is one time programmable memory.
- 2) Mask ROM = - programmed by the manufacturer.
 - one-time-programmable.
- 3) EPROM = - can be programmed many times ~~than~~ by the user.
 - its contents can be erased by UV-light.
- 4) EEPROM = - Electrically erasable ROM.
 - you can erase its content by byte.

Types of RAM

- 1) SRAM :- Made of transistors.
 - used in cache memory.
 - small in size, and volatile.
- 2) DRAM :-
 - Made from capacitors so it is less efficient.
 - large in size.
 - capacitors requires recharging each 64ms.
- 4) NV-RAM :-
 - Combination of SRAM and EEPROM.
 - Data first is stored in SRAM and when power cuts off it copy its data to EEPROM to complete the tasks.

Q6)

Rom can be written to by external devices but not with the μ of microcontroller.

Q7)

Type	Volatile?	Writable?	Erase size	Max erase cycle	Cost	Speed
SRAM	yes	yes	Byte	unlimited	High	fast
DRAM	yes	yes	Byte	unlimited	Moderate	moderate
EPROM	No	yes	all program	limited	moderate	fast
EEPROM	No	yes	Byte	limited	high	fast
PROM	No	only once	No size	No size	low	fast
Masked Rom	No	No	No size	No size	low	fast
NVRAM	No	yes	Byte	unlimited	High	fast
Flash	No	yes	Sector	limited	Moderate	fast