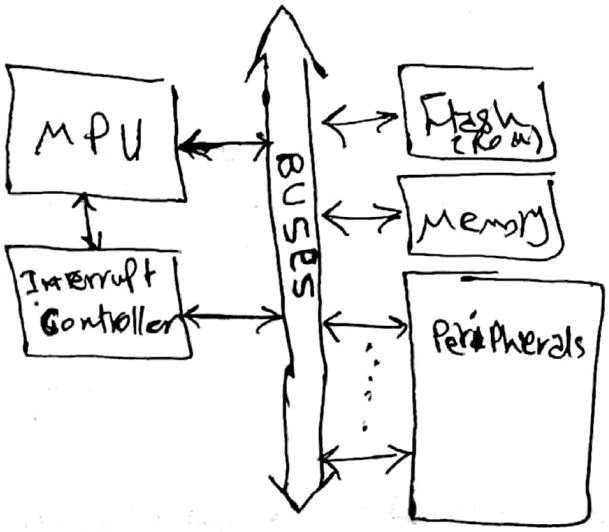
1

Definition	Meaning
micro-processor	is an IC which can perform an arithmetic and logic operations, used in microcontrollers and used for general computing also
micro-controller	microcontroller contain micro processor attached to memory and many peripherals like: ADC, Timer, UART, I2C, SPI, CAN, LIN, GPIO and other peripherals attached to each others using buses 
Embedded Systems	Embedded Systems is a specific or special purpose computer system that perform one or few specific functions there are 2 types of embedded systems [1] Bare-metal [2] OS Applications

Definition	meaning
mechatronic systems	is a system that contain electronics and programming and mechanical parts such as Robots
n-bit Processors	it mean that registers in that Processor contain n-bits and it can access addresses from 0 to 2^n-1, and its Databus width is n-bit or can process n-bits of data at the same time

2

micro processor	micro controller
is an Ic representing Central Processing unit (CPU) Perform arithmetic and logical operations	is an Ic that contain MPU and Rom and memory and other peripherals
General purpose in design and operation	specific application
requires combination of components and chips like interrupt controller and timer and etc	doesn't require external chips like Interrupt controller and timer and etc

3

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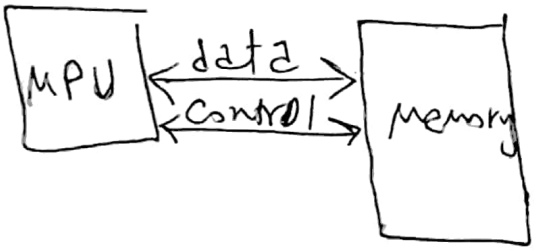
	
* Single bus for data * another bus for control	* Share the same bus for control and data bus

Q4 [1] Masked ROM:

* the data is written during the manufacturing process
* one time programmed

[2] PROM (Programmable ROM):

* can be programmed one time by user

[3] EPROM (Erasable programmable ROM):

* Can be Erased using ultraviolet (UV)

[4] EEPROM (Electrically Erasable programmable ROM):

* Can be Erased using Electricity

[5] ~~Flash ROM~~

Q5 [1] SRAM:

Static RAM Implemented using 6 transistor
Soits faster than DRAM but also expensive

advantages:

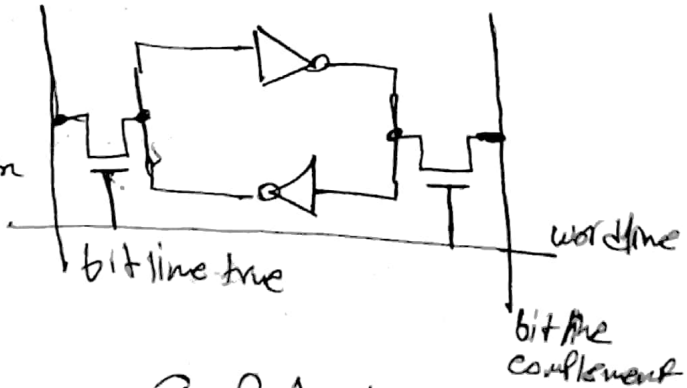
* fast
* medium Power consumption

disadvantages:

* expensive
* more complex
* volatile

Applications:

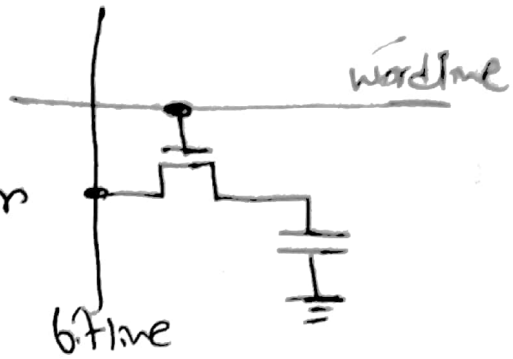
* Caches



SRAM

2) DRAM

Dynamic RAM implemented using 1 transistor and 1 capacitor more size than SRAM



advantages:
* faster compare the flash
* more size than SRAM
* cheaper than SRAM

disadvantages:
* slower than
* volatile
* need to be recharged

applications:
memory

Q 6) ROM is read only at runtime as if you want to write on it the power should be OFF

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type	Volatile	writable	Erase Size	Max Erase Cycles	cost per byte	speed
ROM(MROM)	NO	False	N/A	N/A	cheap	Fast
PROM	No(once)	true	N/A	N/A	moderate	Fast
EPROM	No	true	Entire chip	limited	moderate	Fast
EEPROM	No	true	byte	limited	Expensive	Fast
Flash	No	true	sector	limited	moderate	Fast
NVRAM	No	true	byte	unlimited	expensive	Fast
SRAM	yes	true	byte	unlimited	expensive	Fast
DRAM	yes	true	byte	unlimited	moderate	moderate