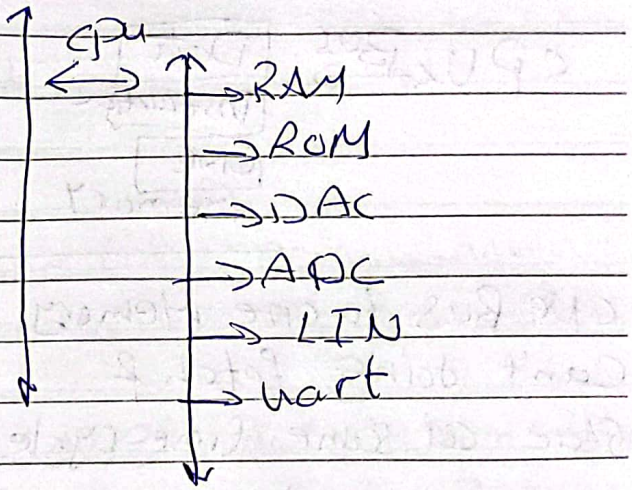
Q1

Defination:	Meaning:
Microprocessor (MPU)	it is processor having three sections ALU: it is the mind which can do mathmetic operations CU: it is control unit that takes data from addresses & send to Registers Registers: Buffer can be store data and have 2 type: Single Register & General purpose Register & Microprocess also have a Bus Contains of: 1- data 2-address 3- control (input, output) & at Recut having Memory unit (cache)
Microcontroller	Contains MPU & RAM & ROM Uart, LIN, DAC, ADC Timer, cpu speed 300 MHZ, at most & single Core

Embedded System	It is way of programming talking low level language as: C , Because it is the layer above assembly , we build Embedded System for any thing automotive
Mechatronic	it is Combination Between Mechanics as Hardware & the Microcontroller as a Hardware to produce a mechanical machine
n-bit processor	Processor works as bits to get & send datas , n maybe 8, 16, 32, 128, 256, ... etc , & if data is too large CPU Broke it into pieces.

Q: Microprocessor | Micro controller



Can be used at many micro controller (General Purpose)

used specific (MPU with another IC's for (specific purpose)

NO ROM, NO RAM, NO I/O

Disadvantages

Don't have ROM, RAM need more cost to add it.

Advantages

- can be used with microcontrollers

have ROM, RAM, I/O ports

Disadvantages

Can't add external memory

Advantages:

ideal to critical space for applicat

Q3

Von-Neuman Architicture	Harvard Architure
CPU <-BUS-> [Data / Instruction] ONE Memory	CPU <-BUS-> Data 1st Memory BUS Instruction 2nd Memory
- one Bus to one Memory Can't doing fetch & Store at same time cycle	- two Bus for two Memory - can fetch & Store at same Time cycle
- Don't support Pipline	- support Pipline
Ex: PC	Ex: Micro controllers

Q4 first what is ROM?

- Readonly Memory
- Non voltaile
- Slower than RAM

3 types:

1- PROM → it is (OTP) one time progammble Programmed only one time after the manfucture.

2- Mask ROM → it is (OTP), But Progammble during Manfuctire, Programmed By Burner.

3- EPROM → (Erasable ROM), can be Programmed multiple time But using ultra sonic or Electric.

4- E²PROM → has same features as (EPROM) But can be programmed using Electricity & can be connected to (I²C, SPI)

5- Flash Memory → Same as (E²PROM) But Faster & Higher Density, lower cost & More Popular than (E²prom)

Q5 First what is RAM?

- Read and write Memory?
- Volatile
- Faster than ROM

Having two types

1- SRAM ⇒ Static RAM
- made of 6 transistors for each 1 Bit
- Expensive
- Don't need Refresh time
Ex: cache

2- DRAM ⇒ Dynamic RAM
- made of 1 transistor & 1 capcitor for each 1 Bit.
- Cheaper than SRAM.
- why Called Dynamic? Because It is recharge every 64MS (16 times per sec). so Refresh time, and that's why slower than SRAM

Ex: DRAM at PC, Because Cheaper

NVRAM. It is SRAM with Battery Packup or wit E^2PROM to be not Volatile

bec expensive, but faster & non-volatile

"Opportunities don't happen. You create them."

Date: / /

Q6) ROM, is Read only memory which Can't w[rite] on it, ~~Expect~~ except can be written using exter[nal] device, or maybe a special configuration where we have an access to write on it.

Q7)

Type	Volatile	Writeable?	Erase size	Max Erase cycles	Cost	Speed
SRAM	Yes	Yes	Byte	unlimit	Expensive	Fast
DRAM	Yes	Yes	Byte	unlimit	Moderate	Moderate
Masked ROM	No	No	N/A	N/A	Inexpen	Fast
PROM	No	~~No~~ Yes (once)	N/A	N/A	Moderate	fast
EPROM	No	Yes (By UV)	Entire chip	limited	Moderate	Fast
E^2PROM	No	Yes	Byte	limited	Expensive	fast to read - slow to write
Flash	No	Yes	Sector	limited	Moderate	fast to read slow to write
NVRAM	~~Yes~~ No	Yes	Byte	unlimi	Expensive	fast

Nour El-houda