Subject _____ Date _____

07 Q. → The definitions:

08 1] Micro-Processor → an Integrated Circuit which
09 Perform The arthmetic and logic operations
10 2-micro-controller → Ic which has micro-Processor
11 and another perefrence like RAM, ROM, I2C, ----
12 3-Embedded systems:- computer system.
13 Combination of micro Processor. Com Pination
14 of memory and peripheral devices to
15 do specific function.
16 4-mechatronic systems: → system in which
17 michanecal hardware are integrated with
18 information
19 5- n-bit Processor →
→ Processor Can work only on n bit of data at time
→ if The data larger than n bit it will broken
into n-bit Pieces.

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1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31

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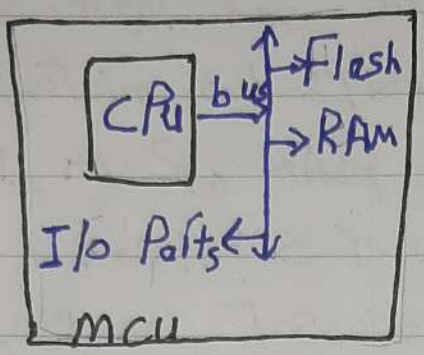
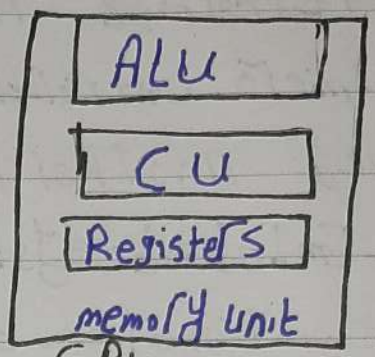
Comparision

2] CPU & MCU



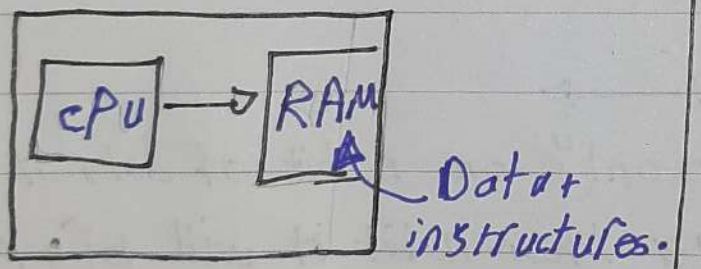
both are an IC but

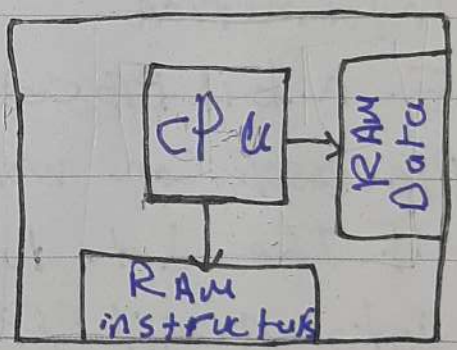


CPU ⟶ ALU + CU + Registers [brain of computer]

MCU ⟶ CPU + Flash + RAM + ...

3] Von neuman & harvard





- ⟶ Used one memory for instructures and datat
- ⟶ ~~Use~~ not use Pipline
- ⟶ Slower

- ⟶ Used Two memory and Two bus [inst's data]
- ⟶ Use Pipeline
- ⟶ faster

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@ROM [Read only memory]

PROM → Programable Rom

→ ~~Data like info~~ → Programed by the User by burner devices

→ Programed only one tim [OTP]

→ we can't write on it [Read only memory]

mask Rom → Read only memory

→ Programed only one time [OTP]

→ Programed during the manufacturing.

EPROM → Erease Programable Rom

→ can earse ~~or~~ and Programed Thousand Times

→ we can earse the information by Ultra Voilot rays.

→ Non Volatile like PRom, Mask Rom

@RAM [Random access memory]

SRAM → Static RAM - doesn't need refreshing

→ Use 6 Transistor to store one ~~bit~~ bit.

→ more expensive. Faster Than DRAM

→ Cash memory one of its Uses.

→ complex - Use ~~High~~ midum Power consumption

DRAM → Dynamic ~~RAM~~ RAM - need refreshing

Use one Tr

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- Use one Transistor and one Capictor to store bit
- refressing time about 64ms .[16time in second]
- during The refreshing we can't access it
- Slower Than SRAM - Simple - Cheap.
- Used in main memory

26] The CPU doesn't have the capecity to write on it.
- Can writen by external device .

Type	Volatile?	Writeable?	Erase size	Max Erase cycles	Cost(per Byte)	Speed	
SRAM	Yes	Yes	Byte	Unlimited	Expensive	Fast than DRAM	RAM
DRAM	Yes	Yes	Byte	Unlimited	moderated	Moderated	Fast than ROM
MASK ROM	No	No			Cheap	Fast	ROM
PROM	No	once			moderated	Fast	
EPROM	No	Yes	Entire chip	Limited	moderated	Fasst	Slower than RAM
EEPROM	Yes	Yes	Byte	Limited	Expensive	Fast to read slow to earse / write	Hybrid
FLASH	Yes	Yes	Sector	Limited	moderated	Fast to read slow to earse / write	
NVRAM	Yes	Yes	Byte	Unlimited	Expensive	Fast	