

## Draw and explain block diagram of microprocessor based system.



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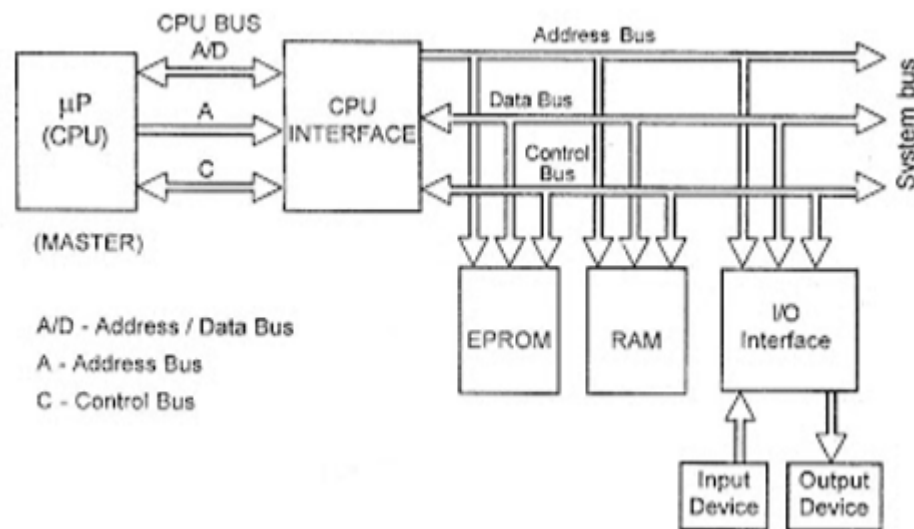


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- The microprocessor is a semiconductor device (Integrated Circuit) manufactured by the VLSI (Very Large Scale Integration) technique. It includes the ALU, register arrays and control circuit on a single chip.
- A system designed using a microprocessor as its CPU is called a microcomputer. The Microprocessor based system (single board microcomputer) consists of microprocessor as CPU, semiconductor memories like EPROM and RAM, input device, output device and interfacing devices.
- The memories, input device, output device and interfacing devices are called peripherals. The popular input devices are keyboard and floppy disk and the output devices are printer, LED/LCD displays, CRT monitor, etc.



- In the  $\mu P$  based system, the microprocessor is the master and all other peripherals are slaves. The master controls all the peripherals and initiates all operations. The work done by the processor can be classified into the following three groups.
- Work done internal to the processor
- Work done external to the processor
- Operations initiated by the slaves or peripherals.
- The work done internal to the processors are addition, subtraction, logical operations, data transfer operations, etc.

- The work done external to the processor are reading/writing the memory and reading/writing the I/O devices or the peripherals. If the peripheral requires the attention of the master then it can interrupt the master and initiate an operation.
- The microprocessor is the master, which controls all the activities of the system. To perform a specific job or task, the microprocessor has to execute a program stored in memory. The program consists of a set of instructions. It issues address and control signals and fetches the instruction and data from memory.

**BUSES:**

The buses are group of lines that carries data, address or control signals.

- The CPU Bus has multiplexed lines, i.e., same line is used to carry different signals
  - The CPU interface is provided to demultiplex, the multiplexed lines, to generate chip select signals and additional control signals.
  - The system bus has separate lines for each signal.
- All the slaves in the system are connected to the same system bus. At any time instant communication takes place between the master and one of the slaves.

**PERIPHERAL DEVICES:**

- The EPROM memory is used to store permanent programs and data.
- The RAM memory is used to store temporary programs and data.
- The input device is used to enter the program, data and to operate the system.
- The output device is used for examining the results.

Since the speed of I/O devices does not match with the speed of microprocessor, an interface device is provided between system bus and I/O devices. Generally I/O devices are slow devices.



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