EC 305 MICROPROCESSOR & MICROCONTROLLER

SOUMYA S
AP IN ECE
CEMP

- **Programmable peripheral interface 8255**

- PPI 8255 is a general purpose programmable I/O device designed to interface the CPU with its outside world such as ADC, DAC, keyboard etc.

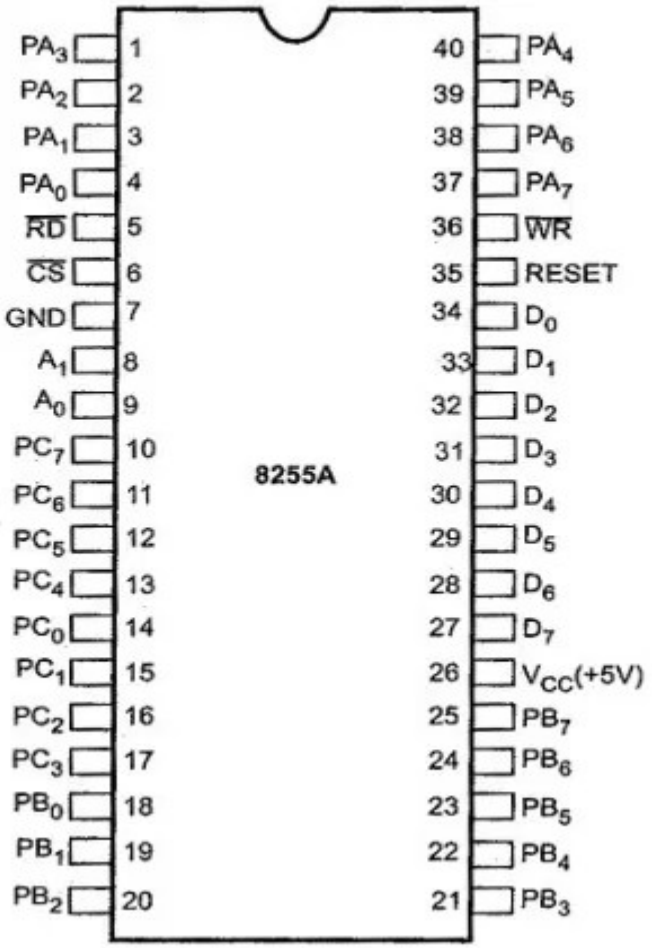
- We can program it according to the given condition. It can be used with almost any microprocessor.

- **Features of 8255A**
- 8255 is a Programmable Peripheral Interface, available in the form of a 40 pin IC which works on a power supply of +5 V DC.
- It is compatible with a wide range of microprocessors and microcontrollers, making it widely popular.
- It has three 8-bit I/O: Ports A, B, and C.
- Port A and port B can function as 8-bit input or output ports.
- Bits of port C are divided into two subgroups of 4 bits each – port C upper and port C lower.
- There are other control pins which are used to specify and control the flow of data and operation of the 8255

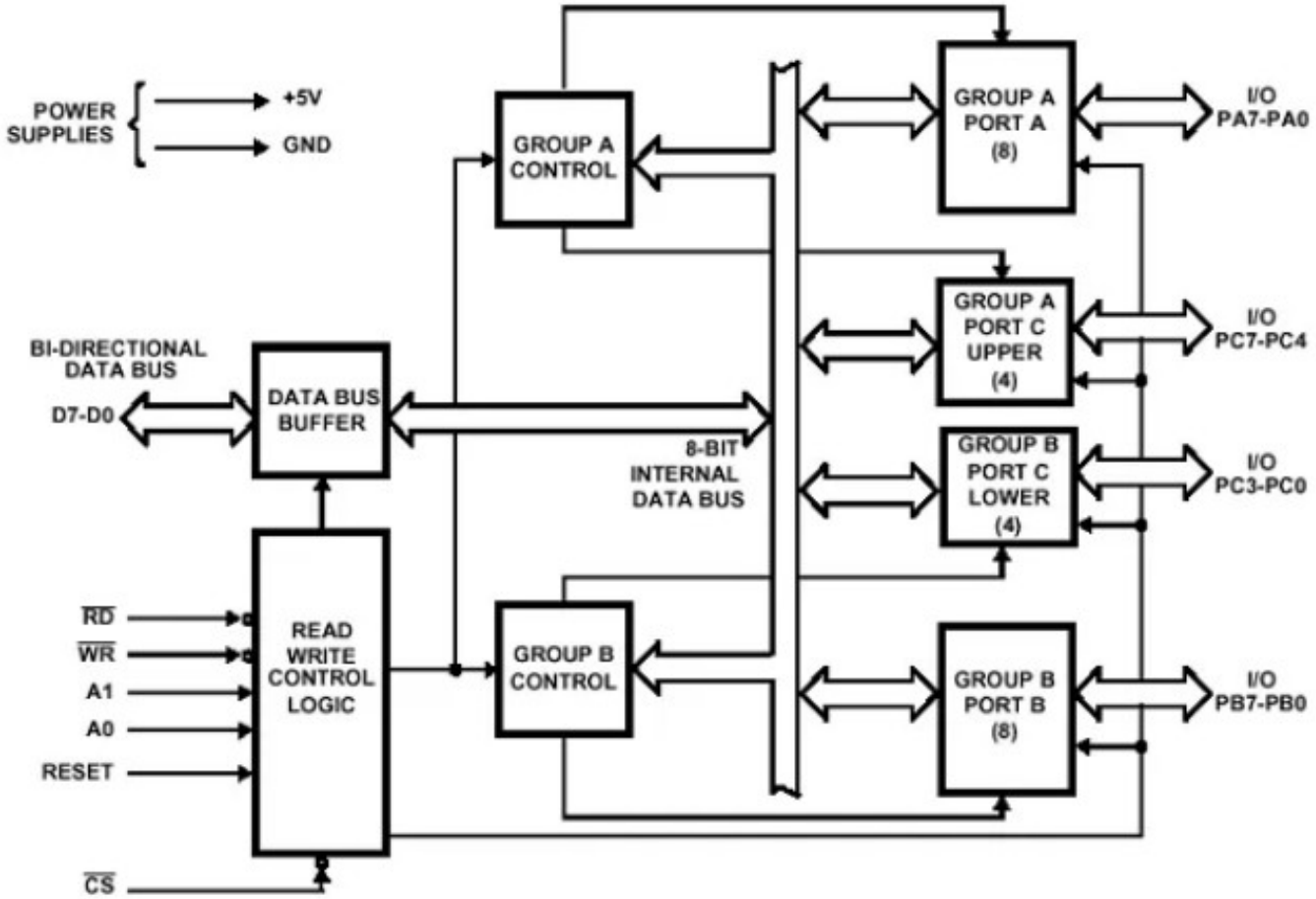
- The most important feature of 8255 is that it is ‘programmable.’ This means that the operation of 8255 can be controlled by programming the microprocessor appropriately. This gives us the freedom to use 8255 in a number of ways without having to change the wiring and connections.
- It has a few different modes of operation. This is awesome because we get the freedom to choose from a bunch of different functionalities.

Pin diagram of 8255

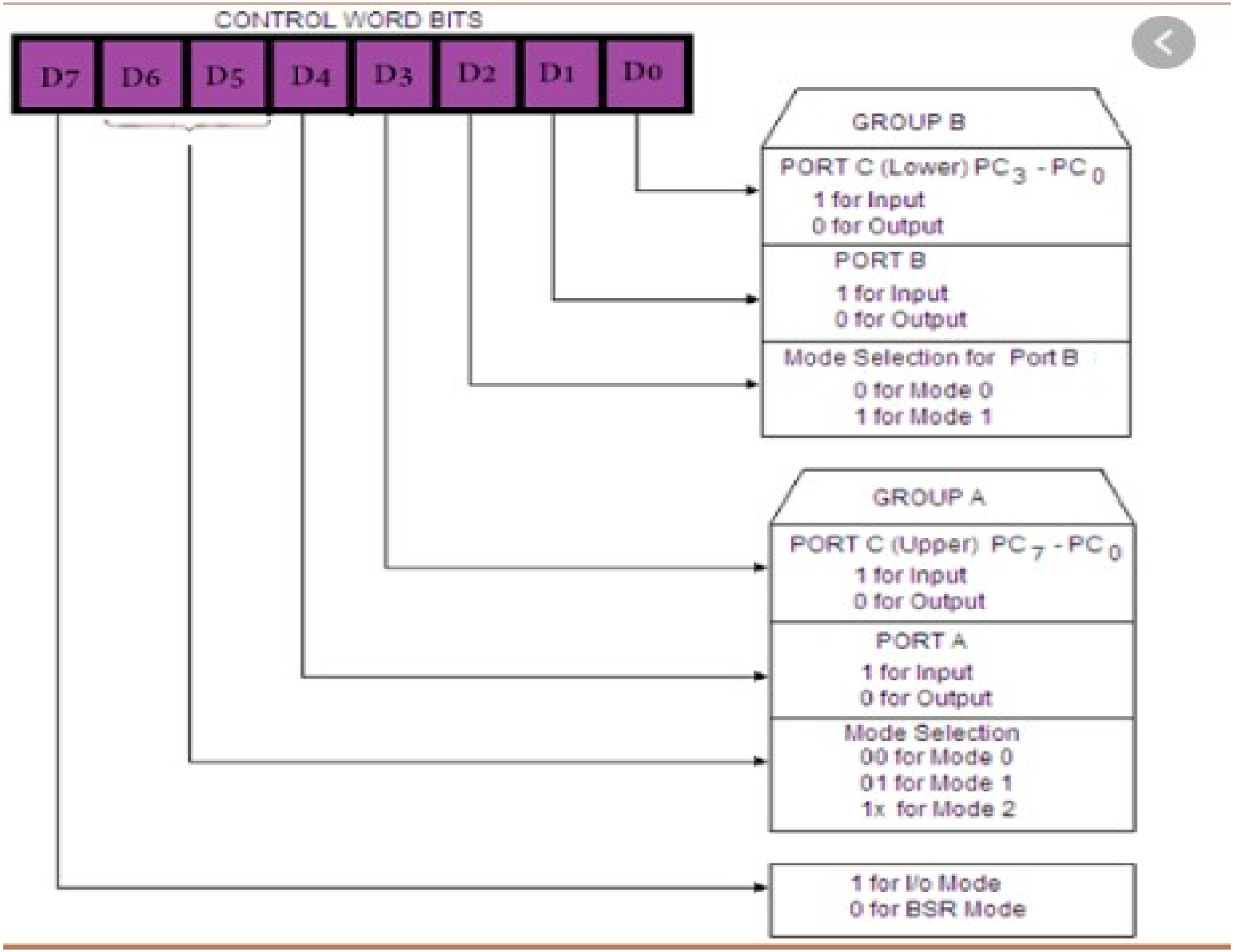
- **PA0 – PA7 –** Pins of port A
- **PB0 – PB7 –** Pins of port B
- **PC0 – PC7 –** Pins of port C
- **D0 – D7 –** Data pins for the transfer of data
- **RESET –** Reset input
- **RD' –** Read input
- **WR' –** Write input
- **CS' –** Chip select
- **A1 and A0 –** Address pins



Block diagram and internal structure of 8255



- **Operating Modes**
- **8255A has three different operating modes −**
- **Mode 0** − In this mode, Port A and B is used as two 8-bit ports and Port C as two 4-bit ports. Each port can be programmed in either input or output port.
- **Mode 1** − In this mode, Port A and B is used as 8-bit I/O ports. They can be configured as either input or output ports. Each port uses three lines from port C is used as their control.
- **Mode 2** − In this mode, Port A can be configured as the bidirectional port and Port B either in Mode 0 or Mode 1. Port A uses five signals from Port C as handshake signals for data transfer. The remaining three signals from Port C can be used either as simple I/O or as handshake for port B.


CONTROL WORD BITS
D7
D6
D5
D4
D3
D2
D1
D0
GROUP B
PORT C (Lower) PC3 - PC0
1 for Input
0 for Output
PORT B
1 for Input
0 for Output
Mode Selection for Port B
0 for Mode 0
1 for Mode 1
GROUP A
PORT C (Upper) PC7 - PC0
1 for Input
0 for Output
PORT A
1 for Input
0 for Output
Mode Selection
00 for Mode 0
01 for Mode 1
1x for Mode 2
1 for I/o Mode
0 for BSR Mode