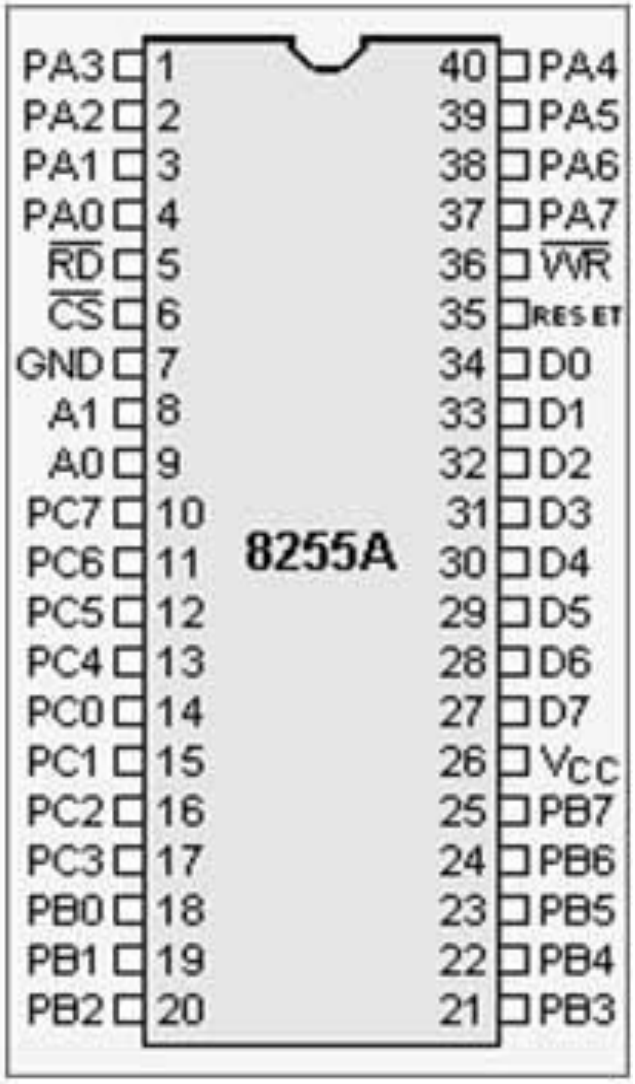
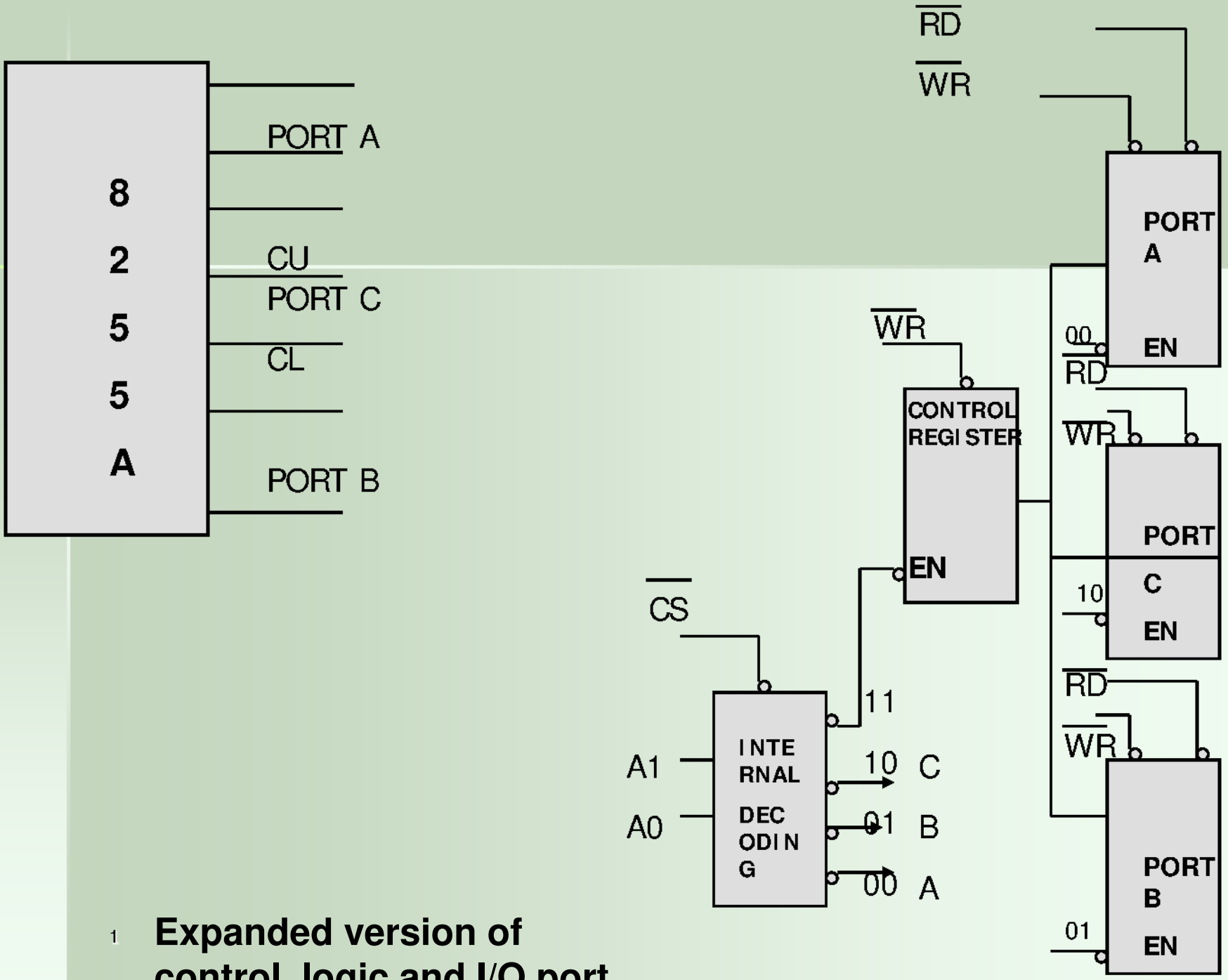
8255 Programmable Peripheral Interface LECTURE 1

Dronacharya Group of Institutions

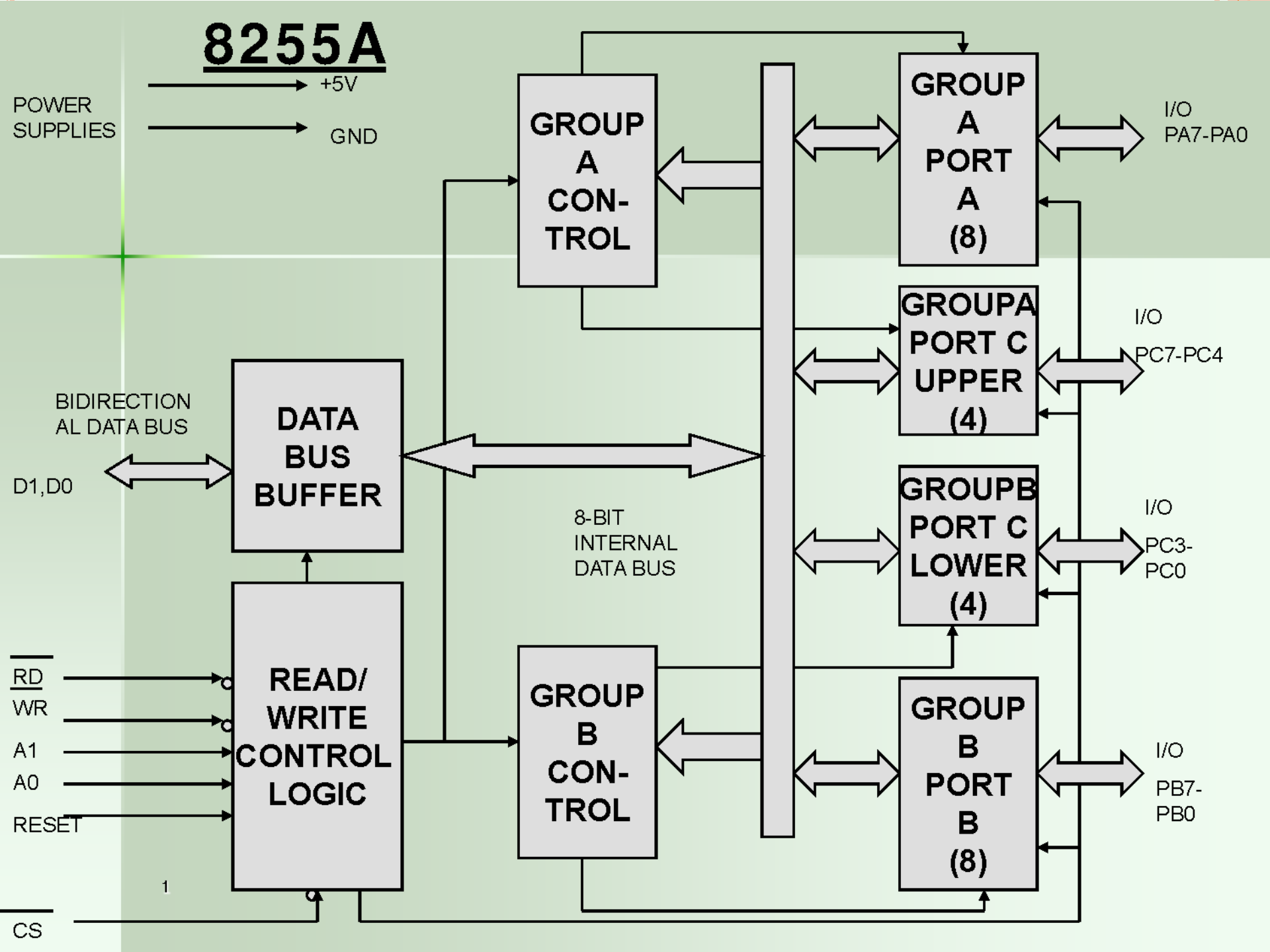
PIN DIAGRAM

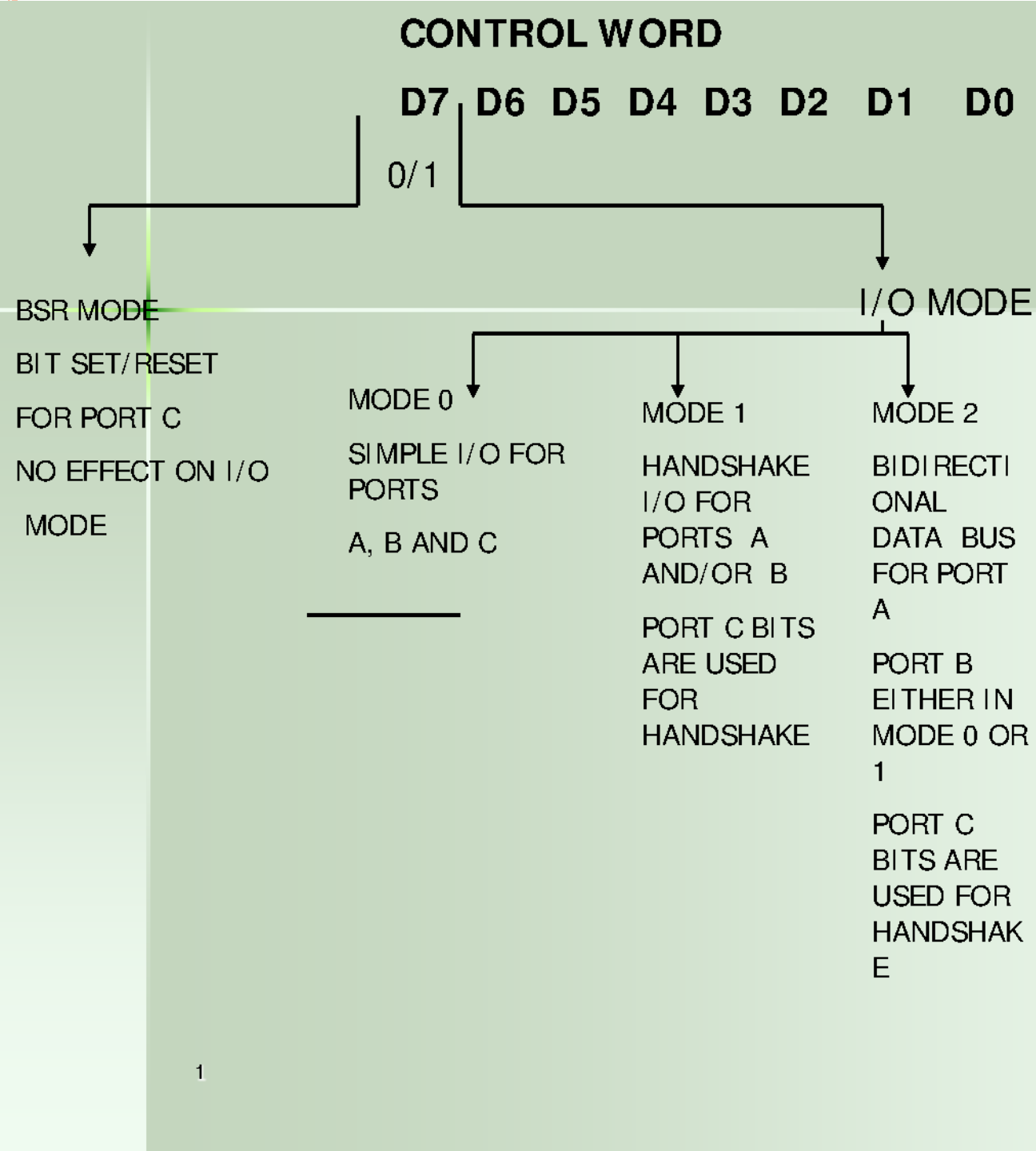


Pin	Description
D_0 - D_7	Data lines
RESET	Reset input
$\overline{CS}$	Chip select
$\overline{RD}$	Read control
$\overline{WR}$	Write control
A_0, A_1	Internal address
PA_7 - PA_0	Port-A pins
PB_7 - PB_0	Port-B pins
PC_7 - PC_0	Port-C pins
V_{cc}	+5V
V_{ss}	0V (GND)

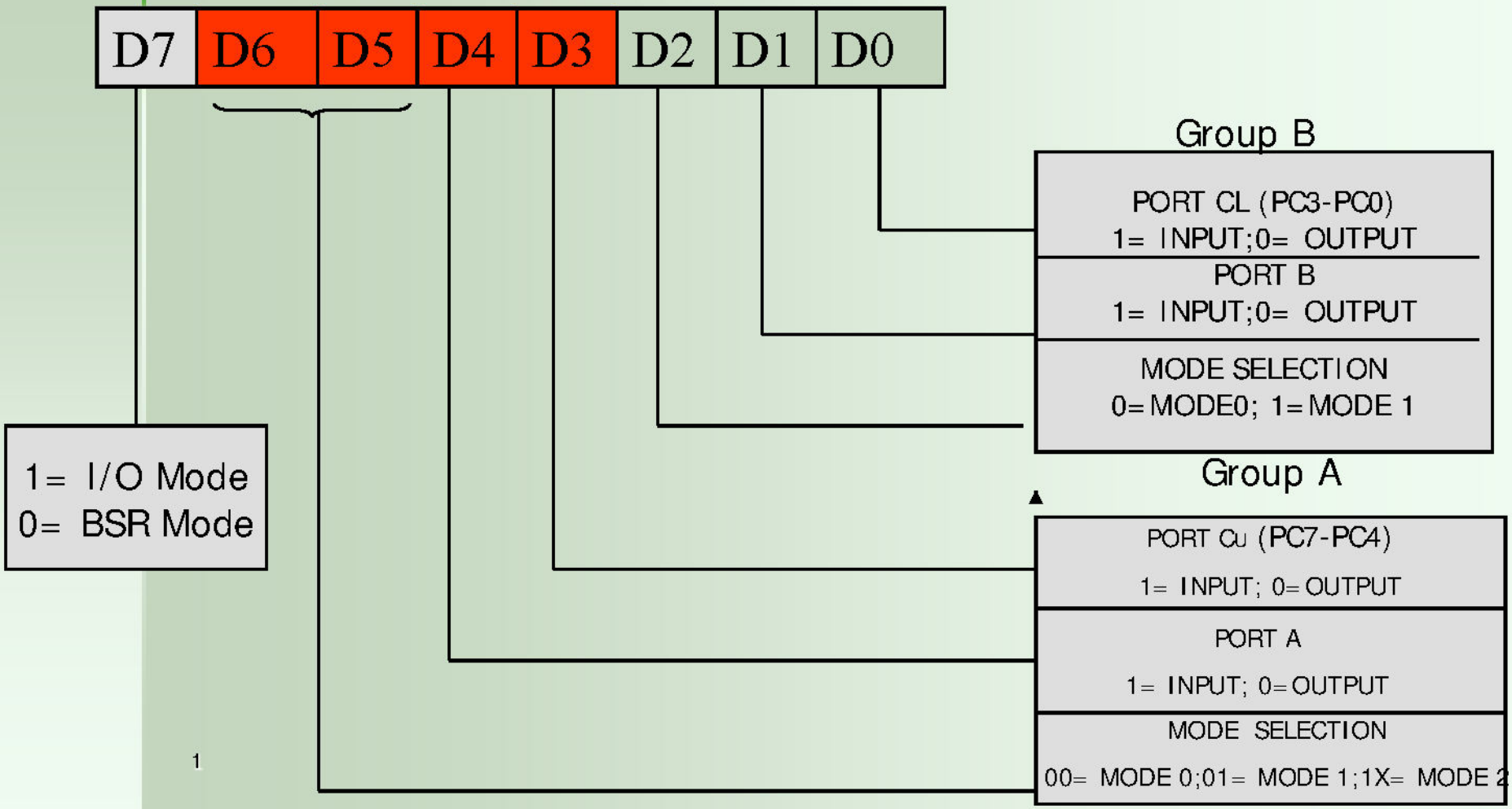


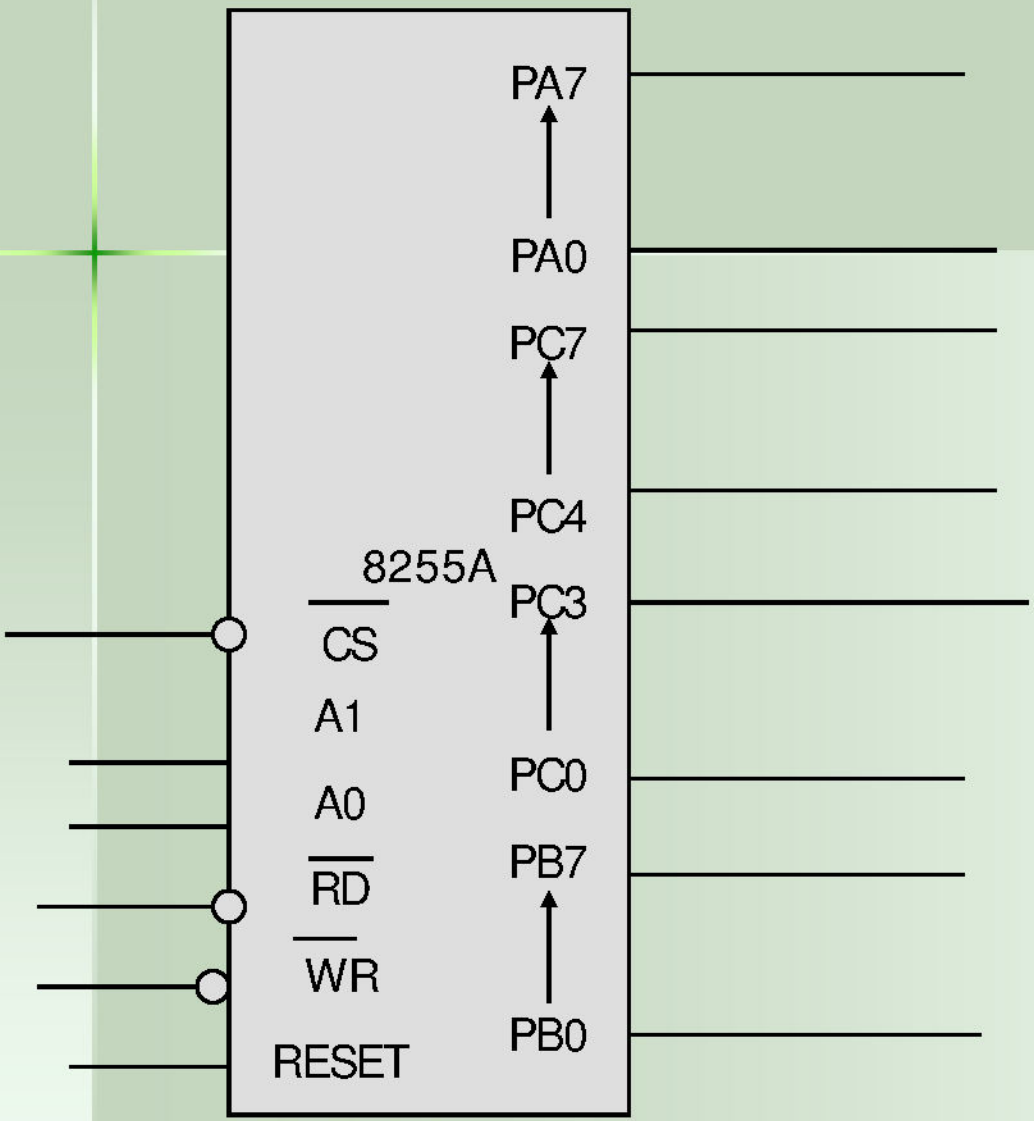
1 **Expanded version of control logic and I/O port**


8255A
POWER SUPPLIES
+5V
GND
GROUP A CON-TROL
GROUP A PORT A (8)
I/O PA7-PA0
GROUPA PORT C UPPER (4)
I/O PC7-PC4
BIDIRECTION AL DATA BUS
D1,D0
DATA BUS BUFFER
8-BIT INTERNAL DATA BUS
GROUPB PORT C LOWER (4)
I/O PC3-PC0
RD
WR
A1
A0
RESET
READ/ WRITE CONTROL LOGIC
GROUP B CON-TROL
GROUP B PORT B (8)
I/O PB7-PB0
1
CS


CONTROL WORD
D7 D6 D5 D4 D3 D2 D1 D0
0/1
BSR MODE
BIT SET/RESET
FOR PORT C
NO EFFECT ON I/O
MODE
I/O MODE
MODE 0
SIMPLE I/O FOR PORTS
A, B AND C
MODE 1
HANDSHAKE I/O FOR PORTS A AND/OR B
PORT C BITS ARE USED FOR HANDSHAKE
MODE 2
BIDIRECTIONAL DATA BUS FOR PORT A
PORT B EITHER IN MODE 0 OR 1
PORT C BITS ARE USED FOR HANDSHAKE

Control Word Format for I/O Mode



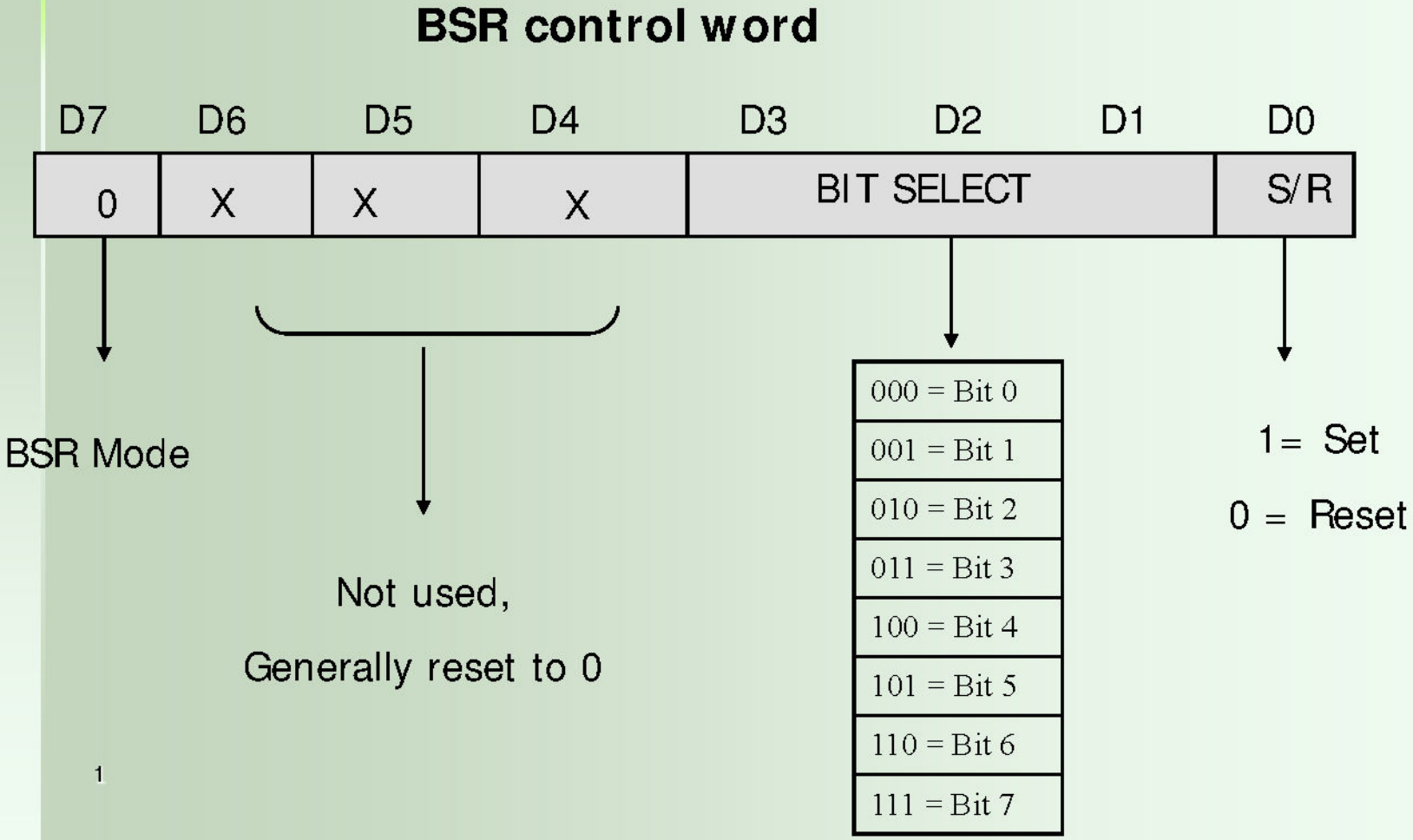

PA7
PA0
PC7
PC4
8255A
PC3
CS
A1
PC0
A0
PB7
RD
WR
PB0
RESET

Mode 0 (Simple Input or Output)

PROBLEM 1)

- Interface 8255a to a 8085 microprocessor using I/O-mapped - I/O technique so that Port a have address 80H in the system.
- Determine addresses of Ports B,C and control register.
- Write an ALP to configure port A and port C_L as output ports and port B and port C_U as input ports in mode 0.
- Connect DIP switches connected to the to input ports and LEDs to the output ports .
- Read switch positions connected to port A and turn on the respective LEDs of port b. Read switch positions of port C_L and display the reading at port C_U

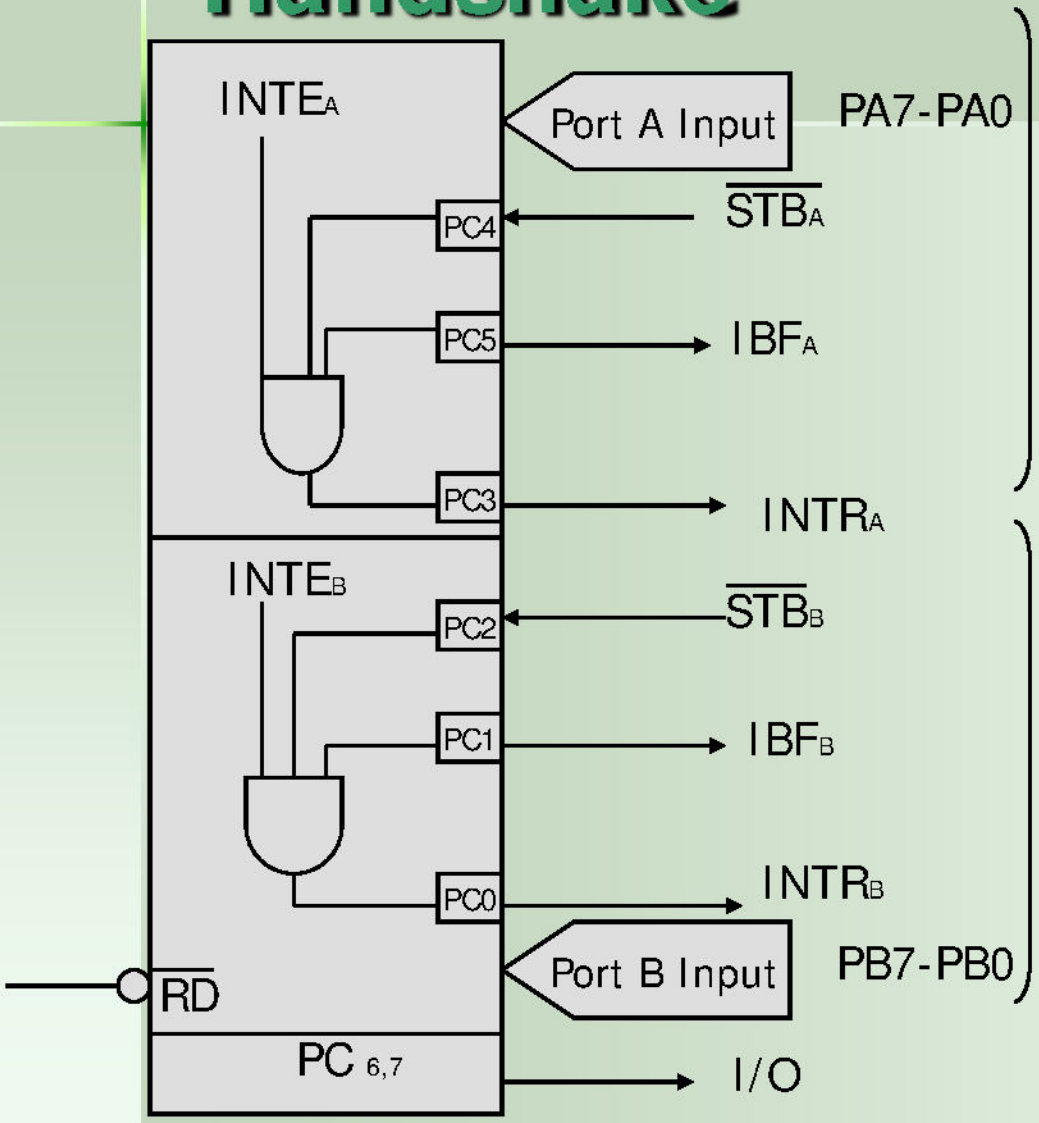
BSR (Bit Set/Reset) Mode



Problem 2)

- Write an ALP to set bits PC7 and PC 3 and reset them after 10 ms in BSR mode.

Mode 1: Input or Output with Handshake

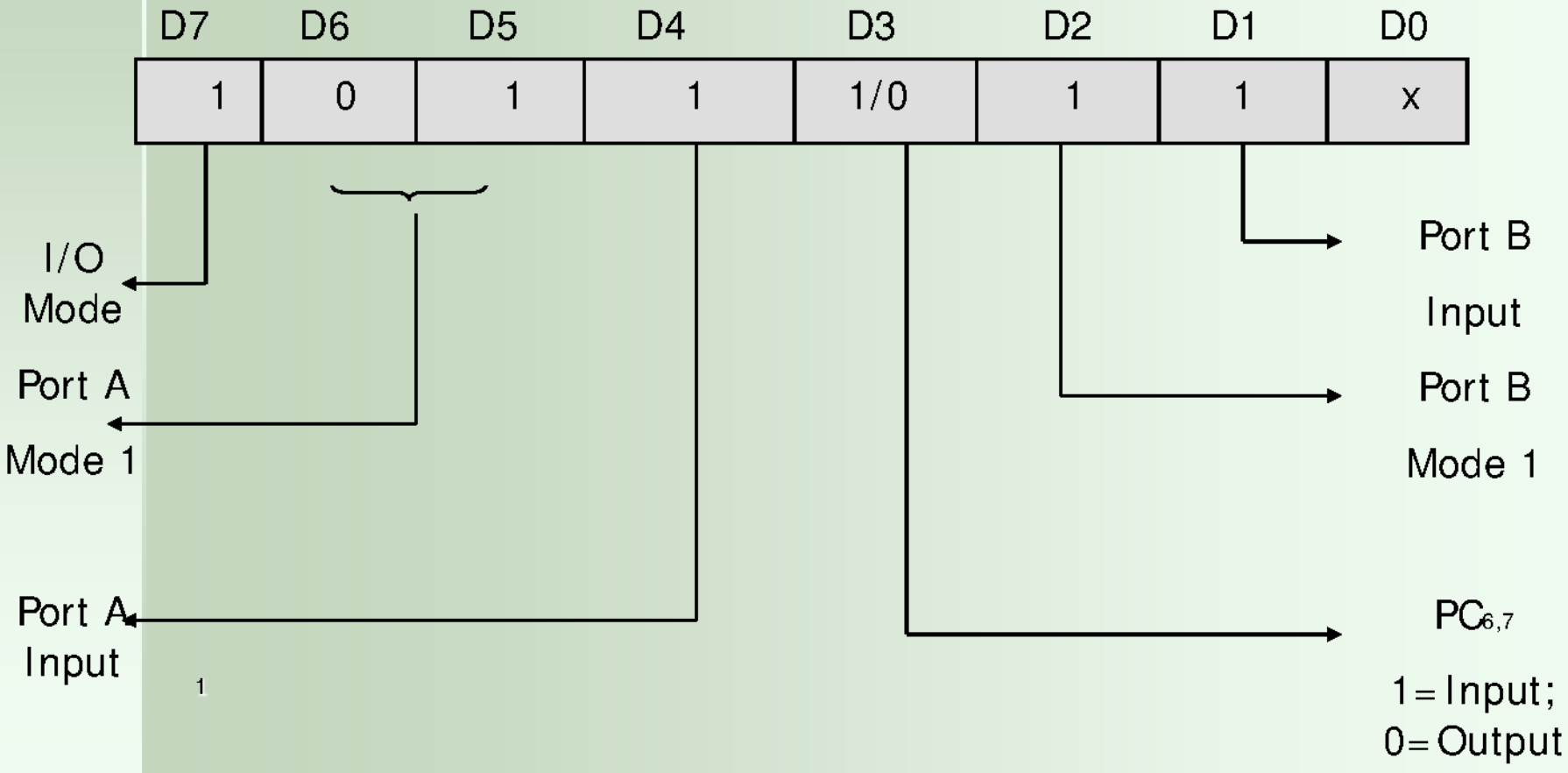


Port A with Handshake Signal

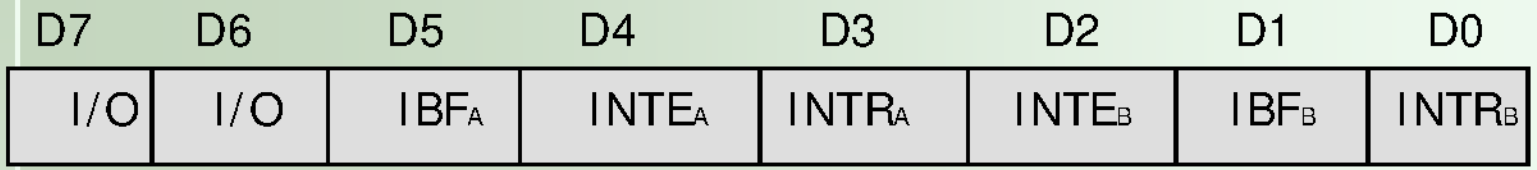
Port b with Handshake Signal

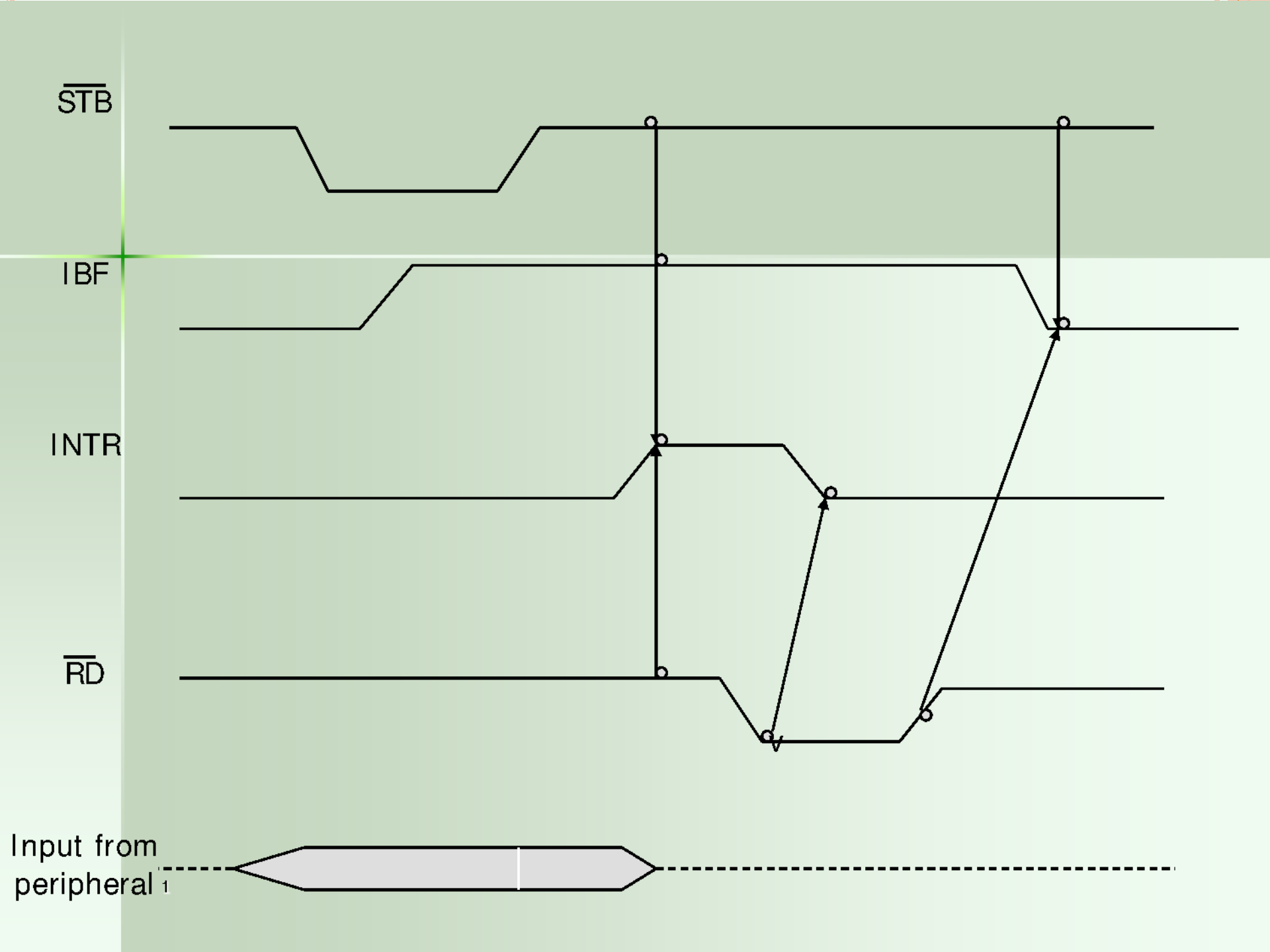
Port A & Port B as Input in Mode 1

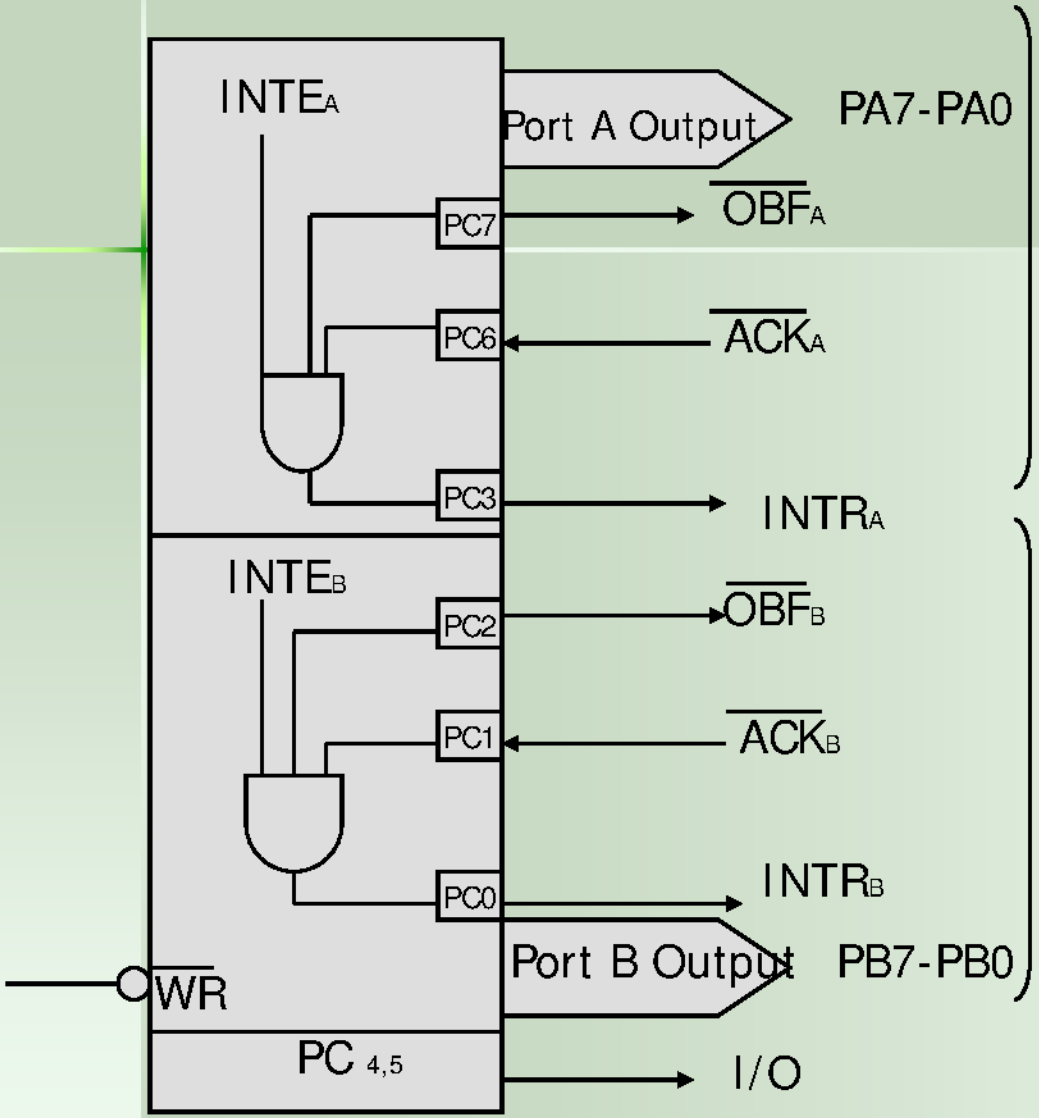
Control word – mode 1 input



Status Word – Mode 1 input




STB
IBF
INTR
RD
Input from peripheral

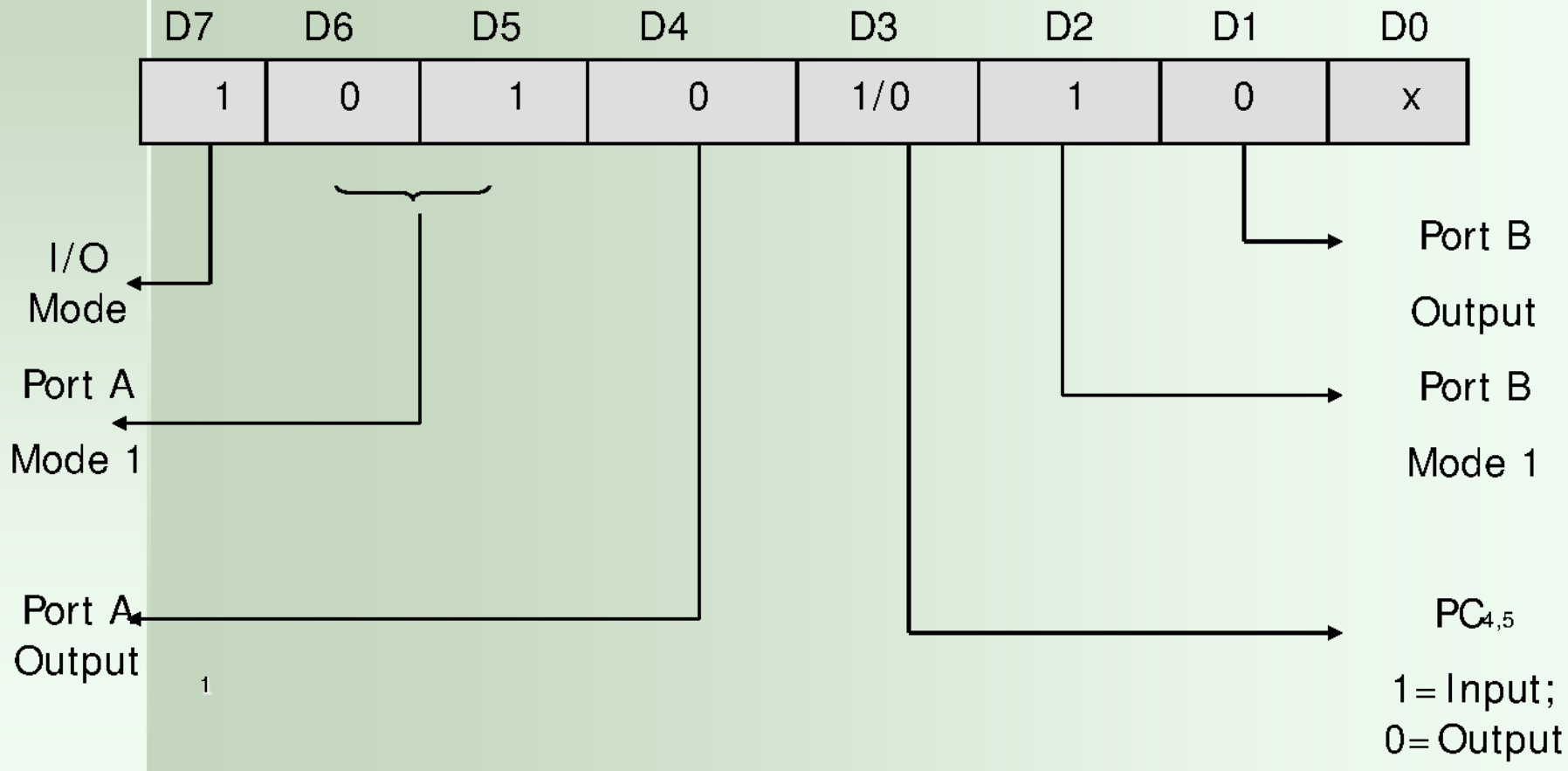


Port A with Handshake Signal

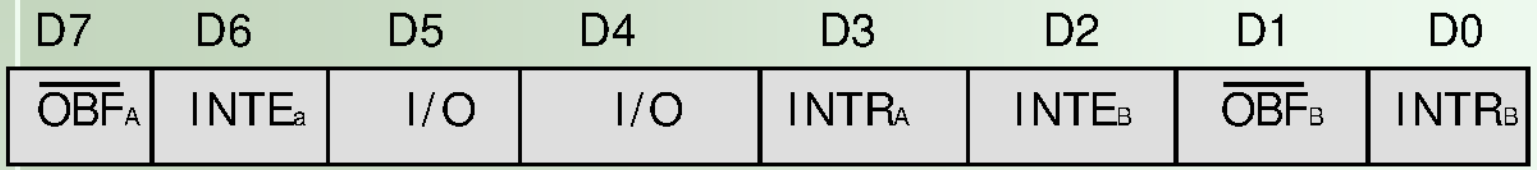
Port b with Handshake Signal

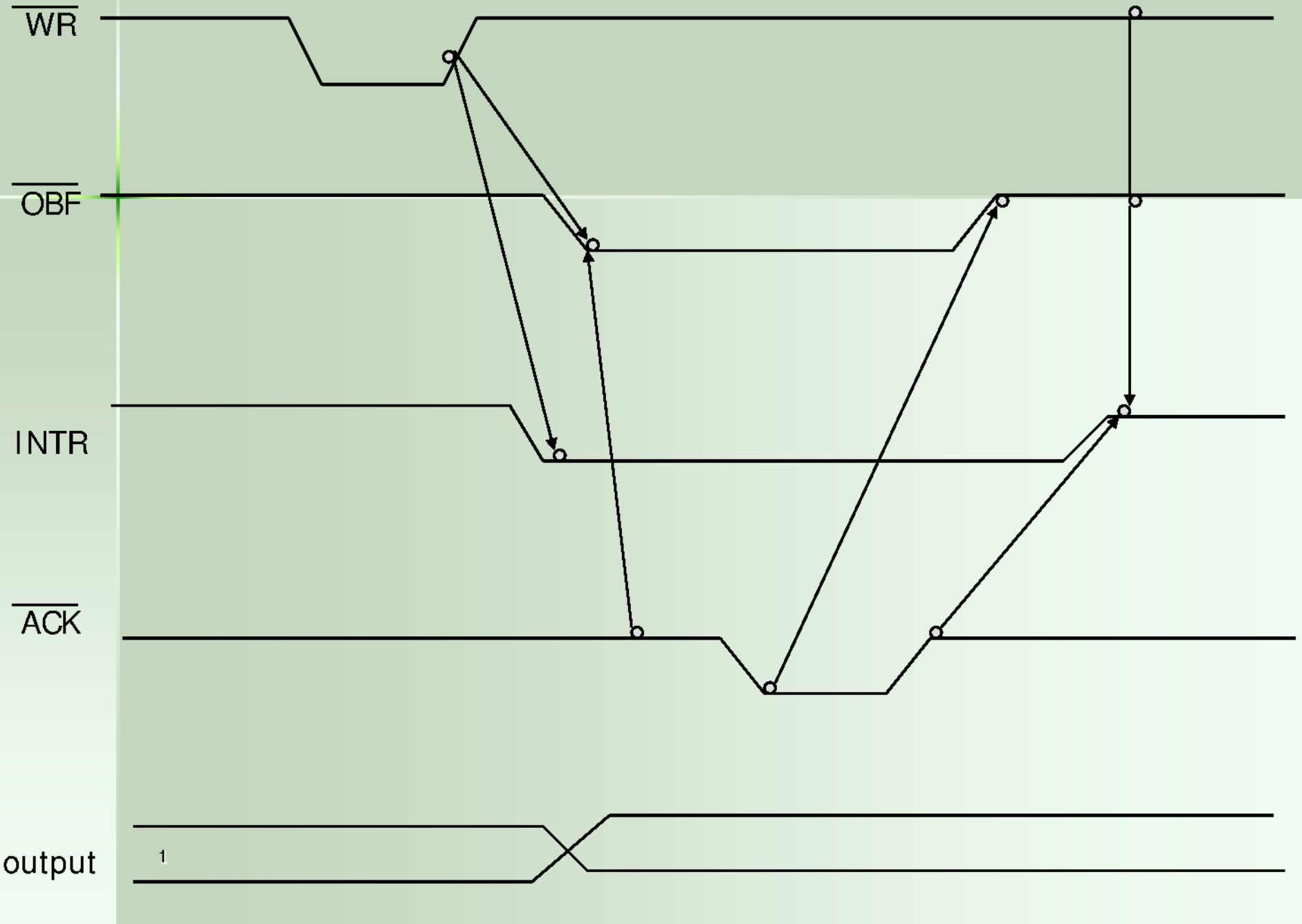
Port A & B as Output In Mode 1

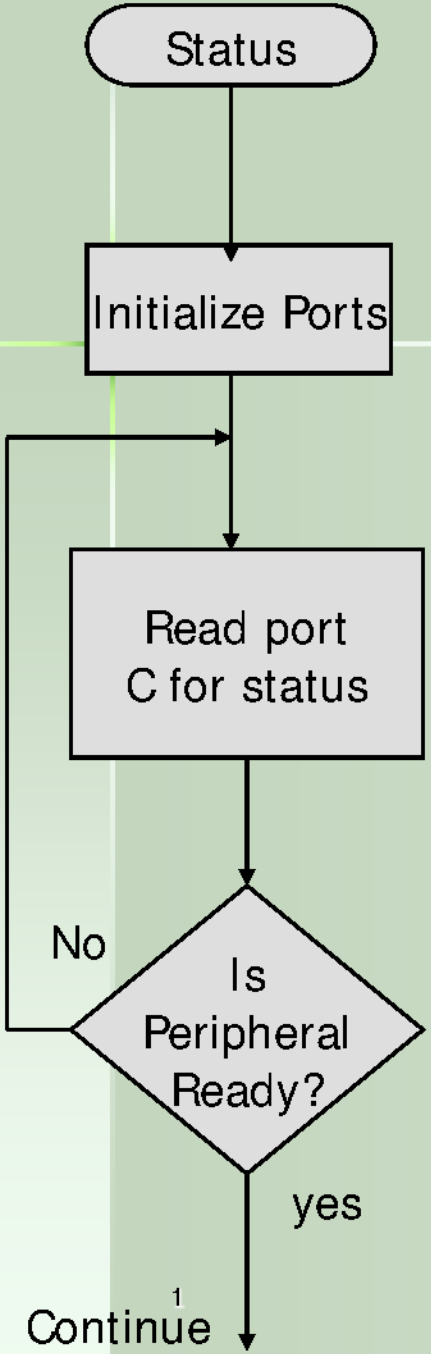
Control word – mode 1 Output

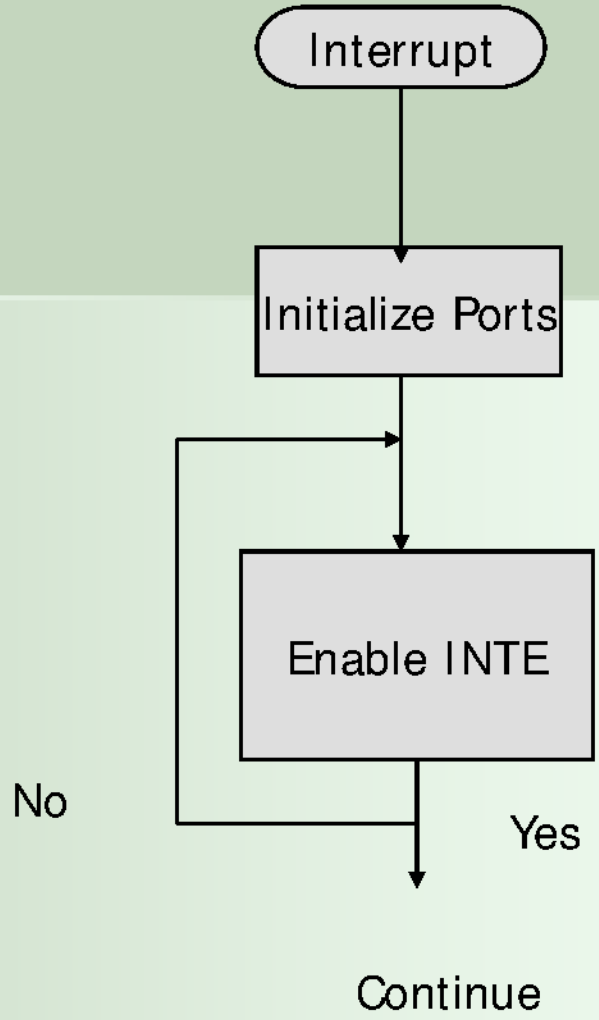


Status Word – Mode 1 Output




WR
OBF
INTR
ACK
output
1


Status
Initialize Ports
Read port C for status
No
Is Peripheral Ready?
yes
Continue
1


Interrupt
Initialize Ports
Enable INTE
No
Yes
Continue

Problem 3)

- Initialize 8255A in mode 1 to configure Port A as an input port and Port B as an output port.
- Assuming that an A-to-d converter is connected with port A as an interrupt I/O and a printer is connected with port B as a status check I/O