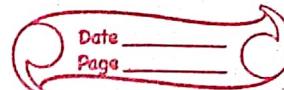


Assignment - 3

Ashwani kr. Chaudhary.



Q.1)

(i) Components

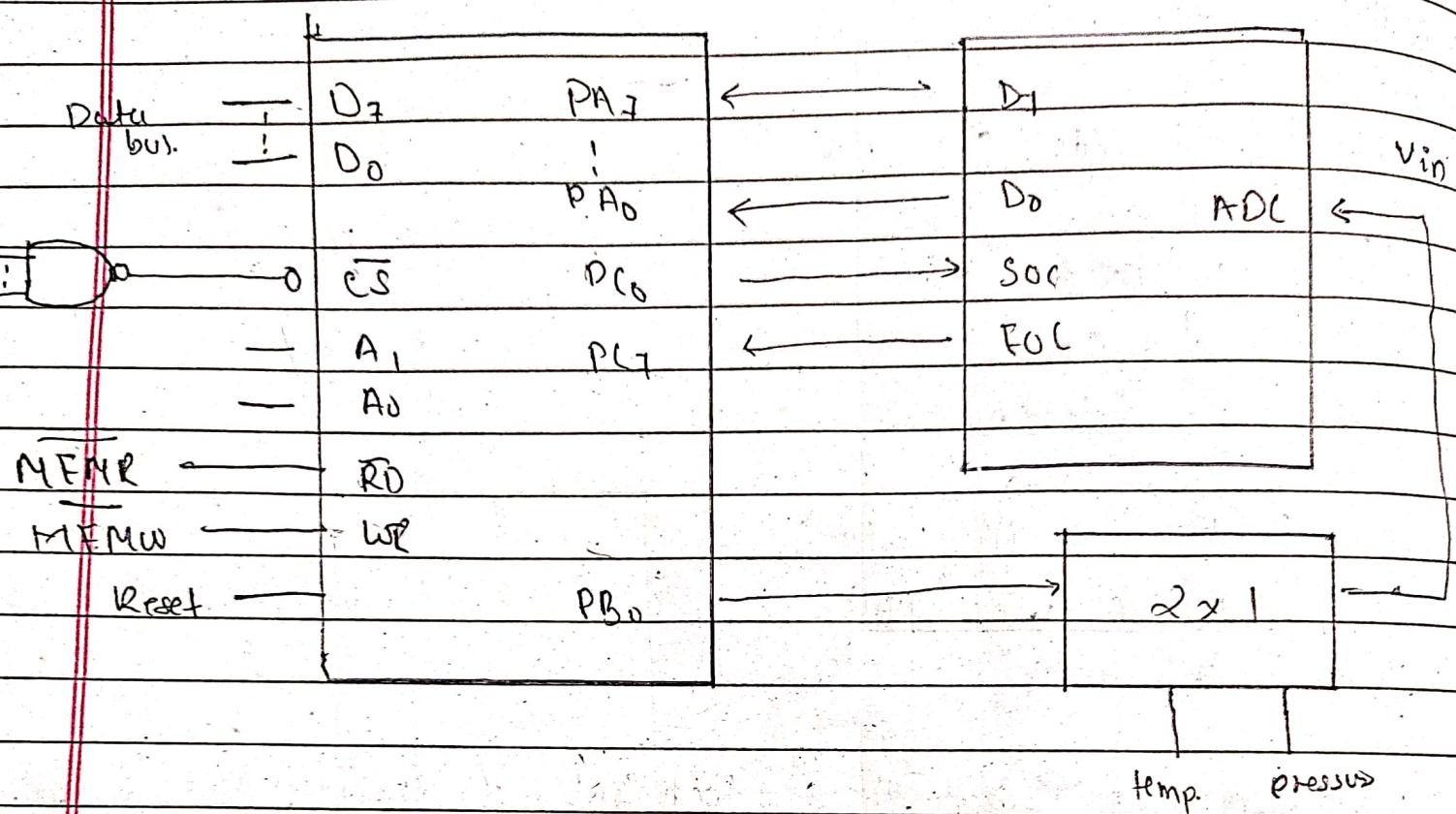
- a) 8255 card
- b) ADC
- c) MUX
- d) Memory
- e) Processor
- f) Connecting Wires
- g) Power Supplies
- h) gate etc.

Documents: Data sheet, technical & specification documents of above mentioned components.

(ii) Signals needed to be derived are:

- A_0, A_1
- Chip select ($C(S)$)
- Read (RD)
- Write ($\bar{W}R$)
- Reset (reset out)
- Start of conversion (SOC)
- End of conversion (EOC)
- Data Line ($D_0 - D_7$)
- Address Lines ($A_2 - A_{15}$)

iii) Minimum Mapping Circuit



(iv) Address captured by the end

Port A = 5000H ($A_1 = 0, A_0 = 0$)

B = 5001H ($A_1 = 0, A_0 = 1$)

C = 5002H ($A_1 = 1, A_0 = 0$)

Control Register = 500311 ($A_1 = 1, A_0 = 1$)

Control word

1	0	0	1	1	0	0	0
---	---	---	---	---	---	---	---

PC_x PC_0

$= 98H$

v) Program Module

LXI H, Memory.

MUL A, 98H ;

STA 5003H ;

MUL B, 00H ;

MOU A,B

Control word by

control register

selection pin for MUX

STA 5003H ;

Select temp for MUX

MUL A, 01H ;

BSR word to set PC0

STA 5003H ;

Read LDA 5002H; read port C for EOC

RLC

JNC READ

LDA 5000H ; read temp at port A

MOU M,A

CPI MAX-VAL

JNC CONTROL

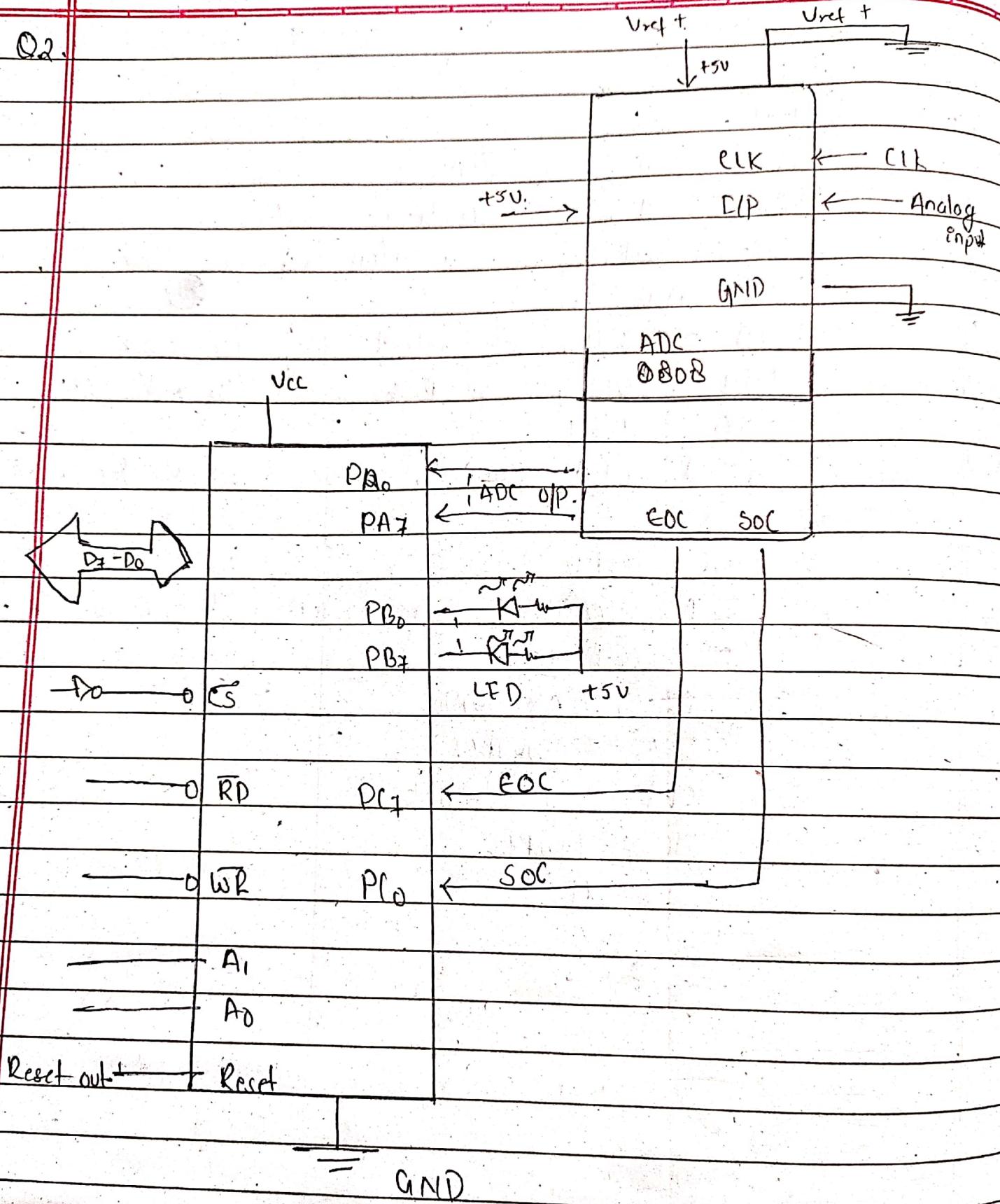
CPI MIN-VAL

JG CONTROL

BNX H

RET

Q2.



Above figure shows the interfacing connection of ADC 0808 with 8085 using 8255. The Analog input is used and a clock input of suitable frequency is available for ADC. Port C lower acts as the output port to send SDC (start of the conversion) to ADC & port C upper acts as the input port to receive the digital data output from the ADC while port B acts as an 8-bit output data port to display the received data using eight LEDs.

Port Address

Circuit 83 I/O mapped I/O using A7 high

Port A = 80H ($A_1=0, A_0=0$)

Port B = 81H ($A_1=0, A_0=1$)

C = 82H ($A_1=1, A_0=0$)

Control register = 83H ($A_1=1, A_0=1$)

Control Word

D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0	
1	0	0	1	1	0	0	0	= 98H

Program to perform the operation.

MVI A, 98H ; Control word

OUT 83H ; Control Register

MVI A, 0FH ; BSR word to set PC₀ (SDC)

OUT 83H ; Start conversion

NEXT : IN 82H ; Read port C to check EOC

RLC ; Check PC₀

SC NFTxT:

IN 80H; read ADC data in Port A.
OUT 81H; display data in Port B.

RFT

Q3.

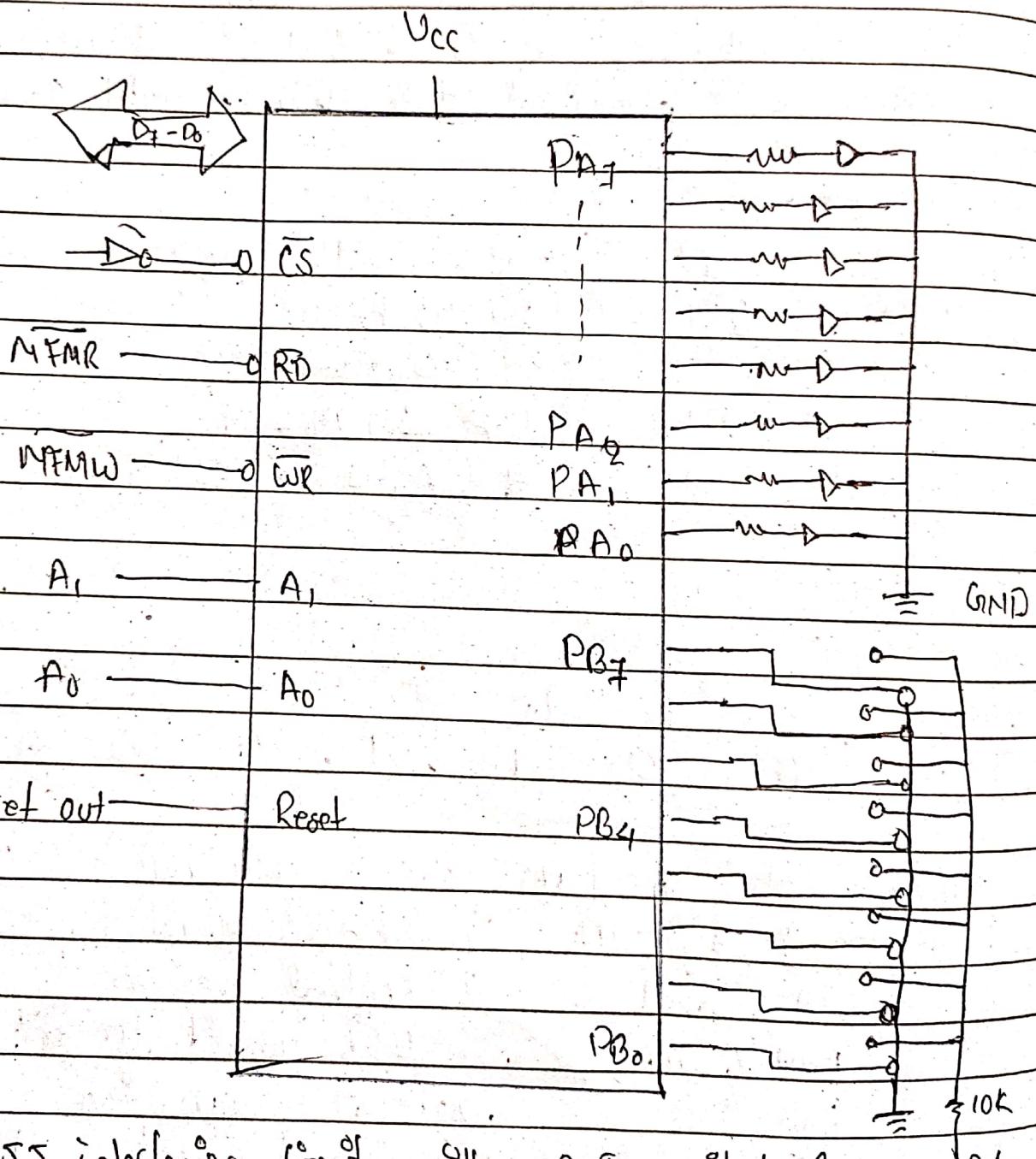


fig. 8255 interfacing circuit with 8PDT switch f
seven segment common (LED) display.

The interfacing circuit is drawn to interface on 8255A with single pole double throw (SPDT) switch & 7 segment common LED display. Here Port B : 9 is connected in mode 0 with SPDT switch no. 50 to S₇, which are tied high through 10 k register. Port A is connected its mode 0 with 7 segment common LED display.

The 8255A connected as memory mapped I/O using A₁ high, the address of individual port are selected as.

$$\text{Port A} = 8000H \quad (A_1=0, A_0=0)$$

$$B = 8001H \quad (A_1=0, A_0=1)$$

$$C = 8002H \quad (A_1=1, A_0=0)$$

$$\text{Central Registers} = 8003H \quad (A_1=1, A_0=1)$$

The control word of the interfacing circuit will be

D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀
1	0	0	0	X	0	1	X

 $\Rightarrow 82H$

Below is the program subroutine to initialize 8255A to detect switch closure & display the switch no. on LED display,

MVI A, 82H ; Control word

STA 8003H ; Control register address

CALL KCHECK ; check if a switch is pressed

CALL KPSH ; check the pushed switch
 CALL KNUM ; check the pressed switch no
 CALL DISP ; display switch no. in 7-segment
 LFD display

RET

KCHECK : LDA 8003H ; read Port B for SPDT switch
 CPI FFH ; check key is pressed or not
 JNZ KCHECK ; if not, wait in loop.

KPSH : LDA 8001H ; read port B for SPDT switch
 CPI FFH ; check key is pressed or not
 JZ KPSH ; if not, wait in loop
 CMJ ; set r for key no.
 SET 0 for other

RET

KNUM : MOJ C, 08H ; set code counter
 NXTR ; DCR C ; adjust the code
 RAL ; place MSB in CH
 JNC NXTR ; if bit = 0 back to check
 MOU A,C ;

RFT

DISP : LXJ H, H(CDT) ; define hex code of no. which
 are stored in look up table

ADDL;

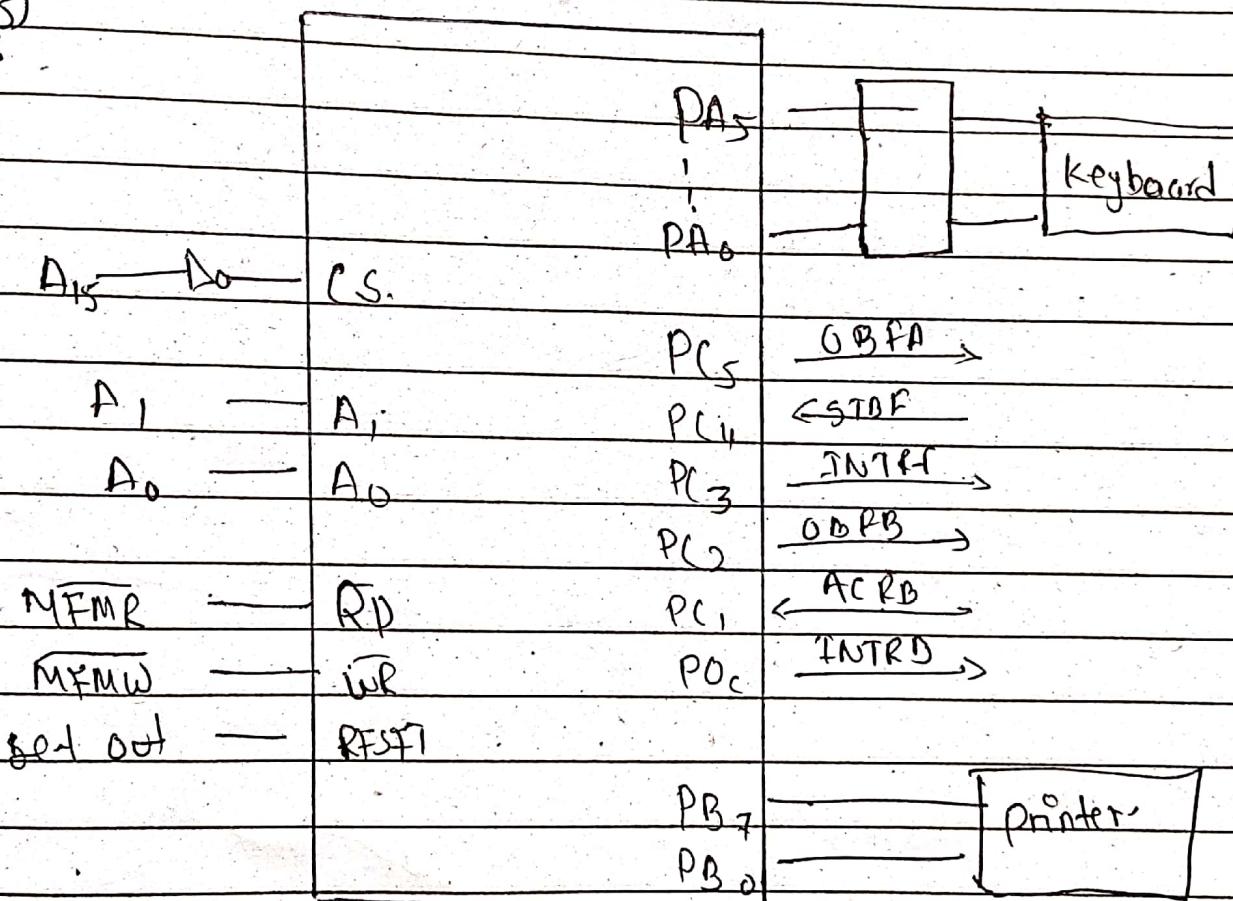
MOU L,A

MOU A,M ; read LFD code to display key no.
 STA 8000H ; display key no. in 7 segment LFD.

RFT

H(CDF : D840H, F9H, 21H, 30H, 19H, 12H, 02H, F8H
 common anode seven segment code for digit
 from 0 to 7 are stored sequentially in memory
 as table look up.

O.M(5)



control word

D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀
0	1	1	X	.	1	1	X = 66H

Hence Port address of

Part A : 2000H

B : 2001H

C : 2002 H.

Central register : 2003 H.