1. Write an ALP program to Scan a 3 X 8 keypad for key closure and

display row and column numbers of the key pressed.

(Port A- input, Port C-output, mode-0 , i/o mode)

; To Enable row through PORT C

OUTPC MACRO

MOV DX,PC

OUT DX,AL

ENDM

;To Enable input through PORT A to scan keyboard

INPA MACRO

MOV DX,PA

IN AL,DX

ENDM

; to display message

DISP\_MSG MACRO MSG

LEA DX, MSG

MOV AH, 9

INT 21H

ENDM

DISP\_CHAR MACRO

MOV AH,2

INT 21H

ENDM

.MODEL SMALL

.STACK

.DATA

PA EQU 0DC00H

PB EQU 0DC01H

PC EQU 0DC02H

CR EQU 0DC03H

M1 DB 10,13,10,13,"ENTERED KEY IS:$"

M2 DB 10,13,10,13,"Row Number is : $"

M3 DB 10,13,10,13,"Column number is : $"

M4 DB 10,13,10,13,”Press ‘C’ from system keyboard to continue$”

M5 DB 10,13,10,13,”Press any key from KB\_INTERFACES$”

ROW DB ?

COL DB ?

CW DB 90H ; Control Word

.CODE

MOV AX,@DATA ; initialize data segment

MOV DS,AX

MOV AL,CW ;initialize the 8255

MOV DX,CR

OUT DX,AL

DISP\_MSG M1

START: MOV AL, 80H

MOV ROW,1 ; Make row=1

MOV COL,1 ;Make col=1

MOV CH,0 ;Keycode=0

MOV BL, 3 ;Total number of rows

NEXTROW: ROL AL,1 ;bit position with 1 enables row

MOV BH, AL ; save al in bh

OUTPC ;Enable Ist Row

MOV CL , 8 ; total no of columns

INPA ; read scan code from keyboard

NEXTCOL: ROR AL,1 ; Any key pressed?

JC DISPLAY

INC CH

INC COL

DEC CL

JNZ NEXTCOL

MOV COL,1

INC ROW

MOV AL, BH ; restore al from saved copy in BH

DEC BL ; reduce row counter

JNZ NEXTROW

START1 : JMP START ; if no keys are pressed from any row start with row 1 again

DISPLAY :

DISPLAY\_MSG M1

MOV DL,CH

CMP DL,0AH

JC DIGIT

ADD DL,07H

DIGIT:

ADD DL,30H

CALL DISP\_CHAR

ADD ROW,30H

ADD COL , 30H

DISP\_MSG M2

MOV DL, ROW

CALL DISP\_CHAR

DISP\_MSG M3

MOV DL,COL

CALL DISP\_CHAR

DISP\_MSG M4

MOV AH,8

INT 21H

PUSH AX

DISP\_MSG M5

POP AX

CMP AL,’C’

JZ START1

MOV AH,4CH

INT 21H

END

**IInd way of doing the same program**

**3. Scan a 8 x 3 keypad for key closure and to store the code of the key pressed in a memory location or display on screen. Also display row and column numbers of the key pressed.**

;Scan a 3 X 8 keypad for key closure and to share the code

;of the key pressed in a memory

;location or display it on the screen.

; Also display row and column numbers of the key

;pressed.(Port A- input, Port C-output, mode-0 , i/o mode)

; To Enable row through PORT C

OUTPC MACRO

MOV DX,PC

OUT DX,AL

ENDM

;To Enable input through PORT A to scan keyboard

INPA MACRO

MOV DX,PA

IN AL,DX

ENDM

; to display message

DISP\_MSG MACRO MSG

LEA DX, MSG

MOV AH, 9

INT 21H

ENDM

DISP\_CHAR MACRO

MOV AH,2

INT 21H

ENDM

.MODEL SMALL

.STACK

.DATA

PA EQU 0DC00H

PB EQU 0DC01H

PC EQU 0DC02H

CR EQU 0DC03H

M1 DB 10,13,10,13,"Press any key from KB\_INTERFACES$"

M2 DB 10,13,10,13,"Row Number is : $"

M3 DB 10,13,10,13,"Column number is : $"

ROW DB ?

COL DB ?

CW DB 90H ; Control Word

.CODE

MOV AX,@DATA ; initialize data segment

MOV DS,AX

MOV AL,CW ;initialize the 8255

MOV DX,CR

OUT DX,AL

DISP\_MSG M1

START: MOV AL, 80H ;Bit pattern to enable row 1000 0000

MOV ROW,1 ; Make row=1

MOV COL,1

MOV CH,0 ;Make col=1

MOV BL, 3 ;Total number of rows

NEXTROW: ROL AL,1 ;AL=0000 0001

MOV BH, AL

OUTPC ;Enable Ist Row

MOV CL , 8 ; total no of columns

INPA ; read scan code from keyboard

NEXTCOL: ROR AL,1 ; Any key pressed?

JC DISPLAY

INC CH

INC COL

DEC CL

JNZ NEXTCOL

MOV COL,1

INC ROW

MOV AL, BH

DEC BL ; reduce row counter

JNZ NEXTROW

START1 : JMP START ; if no keys are pressed

DISPLAY : ADD ROW,30H

ADD COL , 30H

DISP\_MSG M2

MOV DL, ROW

DISP\_CHAR

DISP\_MSG M3

MOV DL,COL

DISP\_CHAR

MOV AH,4CH

INT 21H

END