CSE360

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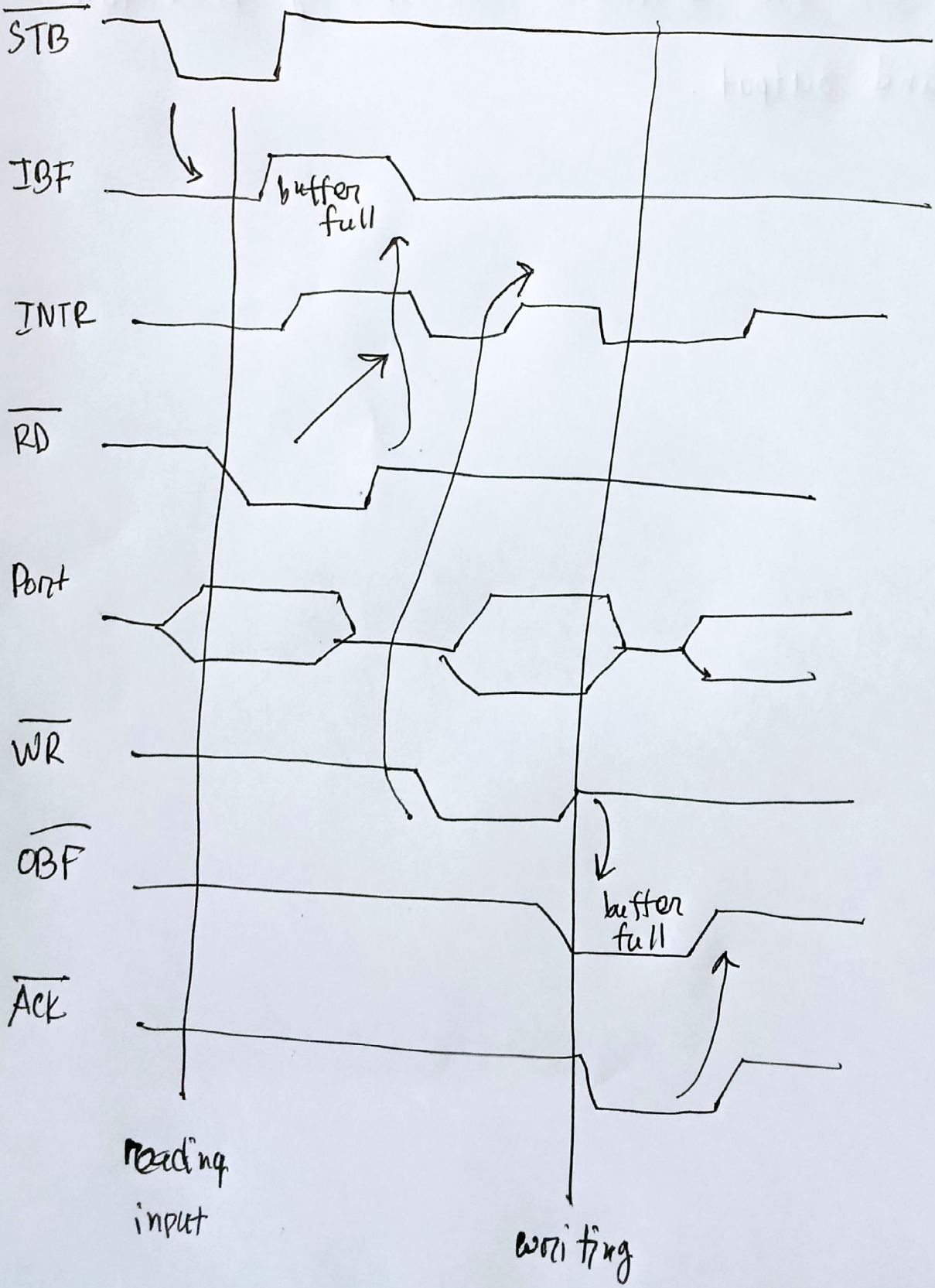
Sec: 7

Ans: to the Q.No 1

(a)

In this process the IPad will take input and provide the output. So it's a bidirectional process done using Port A. So port A is in mode 2 for this task IC will use PC_3 ($INTR_A$), PC_4 ($\overline{STB}_A$), PC_5 (IBF_A), PC_6 ($\overline{ACK}_A$) and PC_7 ($\overline{OBF}_A$) pins from port C. Firsst signal will sent to the IC will be notified through $\overline{STB}_A$ signal. Here $\overline{STB}_A$ becomes 0 and ~~$\overline{IBF}_A$~~ IBF_A become active. Then Ic will interrupt through $INTR_A$ pin to check if the microprocessor is ready to accept the data or not. When it is ready it will active $\overline{RD}$ select port using A_1 and A_0 and read data through $D_7 - D_0$. After IBF_A become low. The microprocessor will send data as output. For this IC will send interrupt through $INTR_A$ pin after select port A using A_1 and A_0 and data send through $D_7 - D_0$ and active

the $\overline{WR} = 0$. Then $\overline{OBF_A}$ will send signal if ~~to~~ ready it will send acknowledgment through $\overline{ACK_A}$ and output data passed through $PA_7 - PA_0$ pin. Finally $\overline{OBF_A}$ disabled.



(d)

In Port A mode to 5 pins are used from PC_3 to PC_7 for handshaking. To avoid pin conflict IC use different handshaking pins for input and output.

Answer to the Q.No 2

(a)

① Create a delay of 20 ms before and after the button is pressed.

② Read the port again.

③ If reading is less than FFH it indicates key is pressed.

(b)

Three steps needed.

① Column identification : Columns are connected to port B and ~~all columns are~~ When we press a button that particular column become 0. For example, if we press 9 the value will become 1101 and comparing each column with (1111) 0FH we can easily find which value has changed.

② row identification : This step all the row value become 1 except the first row. 0111 means we select first row and check if any value has changed or not. Then we will shift the value 0 and compare. If we pressed 1 we will detect a change in 3rd row. When 1101 is passed from the row we ~~are~~ can see a change in the column value.

③ key press identification : In the selected column contains 8.9 0A 0B. By using column configuration 1101 we can right shift the value and check if its 0 or not. After right shifting when we get 0, so 9 was pressed and it stored in keypressed variable.

(c)

To interface a seven segment display with 82C55, I will need 8 pins from port B an 1 pin from each display from port A. My CGPA is 3.48. So to display 3.48 I will need 3 seven segment display. For my CGPA's first digit 3., the value will go to a BCD decoder and converter will provide $\begin{pmatrix} 1&1&1&1&0&0&1&1 \\ a&b&c&d&e&f&g&h \end{pmatrix}$ and for 4 it will provide $\begin{pmatrix} 0&1&1&0&0&1&1&0 \\ a&b&c&d&e&f&g&h \end{pmatrix}$ and for 8 it will provide $\begin{pmatrix} 1&1&1&1&1&1&1&0 \\ a&b&c&d&e&f&g&h \end{pmatrix}$

The value 3 will come through port B 8 pins and port A will send 011, this will show first display. Then 4 will come from port B and A will send 100 which will illuminate 2nd display. Lastly 8 will come from port B and A will send 1000. By this 1 digit is rotating towards right. This process will continue very fast.

Answer to the Q. No 3

(a)

Two type of register are used.

Command register :- To store the command/ control value when RS = 0.

Data register :- To store the data which will be shown when RS = 1

(b) (c)

GND: It should be connected to the ground of Arduino.

Vcc: It is the power supply for the LCD which will be connected the 5 volts pin on the Arduino

V_0 (LCD contrast): control the contrast and brightness of the LCD

RS (register): When RS = 0 command register, When RS = 1, data register.

R/W pin: control whether reading data from the LCD or writing data to the LCD.

Enable: pin is use to enable the display.

D0 - D7: carries 8 bit data we send to the display.

(d)

An 8×8 LED display can be interfaced with IC using 8 pins from port B and 2 pins from port A to configure the Johnson counter. IC will be in I/O mode and so port A, B will be in mode 0. Port B will be connected to columns and port A will connected to row which will configure Johnson counter. Port B will send 8 digit value for the displays that we need to show. For example, for 01111110 Johnson counter will start from T8 and make the whole row 0, here T8 is connected to the last row and Port B will illuminate the corresponding LED's. By this Johnson counter will rotate from T_8 to T_1. Each time it rotate and make the whole row 0 and port B will provide corresponding values for LED's.