PC Interfacing

Fourth Level

Lecture Seven

Questions

Goals:
Up-on completing this lecture, the student should be able to:

1- Review all the information from the previous lectures
2- Use the questions and discussions in this lecture as a check-point to evaluate his understanding for the concept of PC interfacing using the concepts o f Serial and Parallel data transmission.

Lec. 1

- What is the aim of DC power supply, and what are its parts? What is the purposes of these parts?? Draw and explain a DC power supply circuit that provide 16V. How can we get 5V DC from 16V DC? (Support your answer with drawing and full explanation).
- What is the advantage of the resistor with the zener? what is the role of the resistor? is it needed?
- Draw and explain the block diagram and the functionality of the voltage regulator, what is purpose of this circuit? what are the main pin-groups?
- Draw a 6 bit logic-generator and explain how it works (using SPDT)
- How to solve the bouncing issue faced when using the SPDT?

Lec. 2

- What is the Centronic port? And what is the pin configuration of it; list them with their data direction (in/out)?
- What is the principle of sending data on th centronic port? how to utilize it in the design?
- Draw and explain the groups of the Centronic port pins?
- how to read a 12 bit data-bus on the parallel port? Design and show the pseudo-code.

Lec.3

- What is the RS232 port? And what is the pin configuration of it (3 bit) (8 bit); list them with direction and functions?
- What is the serial data transmission UART and what is RS232? Explain them in details?
- Draw and explain the connections type of RS232 between computer and an external TTL device ?
- Draw and explain the logic structure of the RS232 frame
- What is the null Modem (3 wire and 8 wires with hand-shake) explain A to B and B to A? what are the settings which give A) highest throughput B) highest immunity for the serial port
- Design a circuit to send the data of a 10 bit A/D using the serial port, with the supporting code

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Lec.4

- In the experimental board of the Centronic, why the fifth line of the status is connected permanently to the ground?

- Draw and explain the power supply circuit which can be obtained using 7805

- How can be expanding output of Centronic, Draw and explain in details?
- How can be expanding the Centronic using 74LS241 and 74LS373 (tri-state buffers and lateches)?

- How to utilize the 8255 in expanding the parallel port? what is the design principle?

Lec. 5

- Draw and explain the simplest circuits of converting RS232 voltage level to TTL voltage level?

  what is meant by a line-driver?
- Explain in details the expanding of the RS232 using UART?

  what is the CDP6402, what are the general guidelines under which it works? also explain how it can be used with RS232? and why to use it instead of an MCU?

Lec. 6

- What is the concept for RS232 using ITC 232, draw and explain?
- How can the conversion between serial and parallel be done, explain and draw in details?

- **General notes**

  All the design questions will be accompanied by the corresponding pseudo-code

- Be careful in the design if you are asked to design anything then you are free to use and select any appropriate ICs component you need in the design, also be careful in numbers of I/O in the design. May be in the book there is a design with output or input (8, 16 or whatever), you may be ask to design less or more lines of inputs or outputs, how to do it? As we said in the above you are free to use and select any appropriate ICs component you need to achieve your tasks.

Summary

A comprehensive overview about the topics for lectures 1 through 6 has been introduced in a series of questions. The Q&A revolved mainly about: power sources, serial and parallel data transfers which have been done through the series of given questions.

Good Luck :)