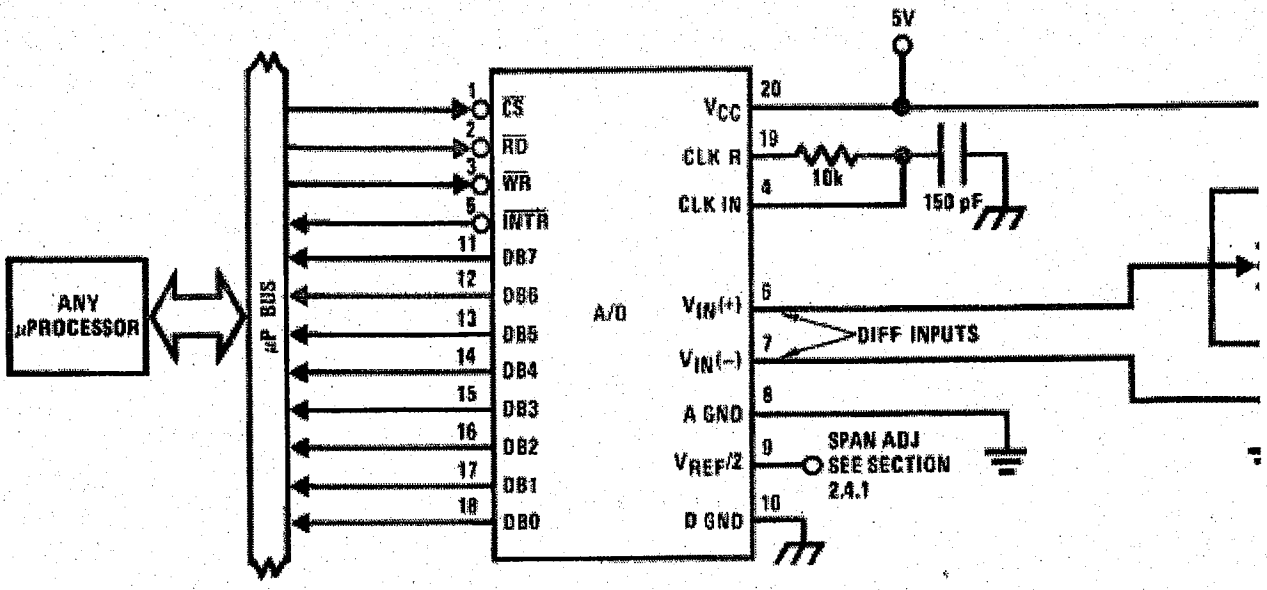
Uva Wellassa University, Sri Lanka
End Semester Examination – June 2009
CST381-2 Device Interfacing and Embedded Systems
Time: Three (02) hours

Total 05 Questions
Answer 04 questions only
Please returned the question paper with the answer script

01)

I. You are given following components/ICs and a personal computer with a parallel port.
- ADC0804 8bit parallel ADC
- An NTC thermistor
- Passive components like resistors and capacitors.



You are required to find out the melting point and the boiling point of particular oil using above components.

a. Draw a circuit diagram of how the above components and the PC should be inter connected. You have to describe how the parallel port pins are used in this particular setup.

b. Write a function in whatever the programming language you prefer to read data from the data port of the parallel port. (Assume a parallel port driver dll like inpout32.dll is available)

II.

a. Draw a circuit diagram of how three SSDs can be connected to a PC parallel port to display a three digit number.
b. Describe the steps you have to follow in your computer program in order to display a value contained in an integer variable. (You can use Visual Basic, C language, pseudo codes or English language)

(25 marks)

02) You are required to make a stand alone digital voltmeter using a pic microcontroller of your choice. You can use either lcd or SSDs as the display. (Anyway the display should have at least 4 digits).

I. Design your circuit and draw the schematic diagram.
II. Design your pic microcontroller program and write the major functions (acquisition and display) in c language. (You can assume delay and lcd routines are available)

(25 marks)

03) You are required to design a security system for Uva Wellassa University (admin block). It has 10 halls. Each hall has 10 filing cupboards where valuable items are kept. If these filing cupboards are opened or broken in unauthorized way, an alarm should trigger in the main security room located approximately 50m away.

I. What are the main factors that need to consider when selecting such a sensor? Suggests a sensor to be used inside filing cupboards to protect valuable items.

(10 marks)

II. How many ways are there to supply power to the above sensor? Using a battery or by a Separate DC power adaptor attached to a wall socket outlet.

(5 marks)

III. As a system designer which power supply method will you select? Give a Reason for your selection.

(10 marks)

04)

I. Describe what are 3 characteristics of embedded systems? (3 marks)

II. Embedded Systems talk with the outside world via peripherals, name 6 Peripherals (3 marks)

III. What is the difference between information **system** and **embedded system**? (4 marks)

IV. What is the difference between an embedded system and a desktop system? (4 marks)

V. Why Consumer electronics Telecommunications systems and Computer system need embedded system? (5 marks)

VI. What hardware and software resources are required for designing an embedded system for an elevator system in a five storied building? (6 marks)

05) In interfacing applications transducers are use to convert the physical signals to electrical signals. Signal conditioning methods are involved in transducers in order to get proper electrical representation of physical signals.

I. Explain five signal conditioning methods associate in transducers. (10 marks)

II. Clearly indicate difference between a counter and a timer. Give at least one application for each component. (10 marks)

III. What is a real-time clock? (5 marks)