CCE 2002 – Microprocessor Systems

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Tutorial III

1) The 8086 can be operated in MINIMUM mode and MAXIMUM mode. Explain with the help of diagrams how the 8086 can be interfaced to memory using these modes.

2) Describe the function of the 8288.

3) Draw the interrupt vector table indicating the format in which the vector would be stored in these locations. Give an example using INT 52h assuming that it contains CS = 1FFEh and IP = 012Eh.

4) Explain the difference between an input and an output parallel port. As an example design the ports for IN AL, 6Eh and OUT 49h, AL.

5) Describe the timing diagrams for a parallel I/O read cycle and an I/O write cycle (assume minimum mode).

6) Write a program that is capable of generating asynchronous serial data.

7) Explain the technique of transmitting serial data using asynchronous communication. What would be the data rate and character rate if the bit time is (a) 2.25 ms, and (b) 7.12 ms?

8) What is the maximum mismatch between transmitted and received data using asynchronous communication?

9) Describe the function of the UART.

10) Describe a protocol for synchronous serial communication. Calculate the gain in efficiency of a synchronous protocol with respect to an asynchronous protocol (assume 8 data bits, 2 stop bits, 1 parity bit) for a 100 byte data block size.

11) Describe the 8251 USART.

12) Explain how a parallel printer can be interfaced to the 8086 using programmed I/O.

13) Describe Interrupt driven I/O. What is the interrupt response time? Calculate the minimum interrupt latency time assuming a clock of 5 MHz.

14) Explain the direct memory access technique for controlling the flow of data through an I/O port.
15) By using a block diagram, describe the 8255 PPI.

16) The 8255 has to be programmed for the desired mode and I/O configuration, discuss the functions of the 8255 when programmed in the three different modes. Show the timing diagrams when operated in mode 1.

17) Describe the 8255 control word format. What would be the control word for the following: (a) port A input, port B output, port C upper input, and port C lower output, (b) port A mode 1 input, port B mode 1 output, and the remaining bits of port C input, and (c) port A mode 2 and port B mode 1 output?

18) By using a block diagram, describe the 8259 PIC.

19) Describe the 8259 operating modes and the control words required by the PIC for initialisation and operation control.

20) By using a block diagram, describe the 8254 Timer.

21) Describe the read and write operations of the 8254 and define the 8254 operating modes.