CSE341: MICROPROCESSORS

Brac University

Assignment 2

PIC

1. [*2+2=4 points*] Suppose, you need to service 48 hardware interrupts on your 8086 microprocessor. Explain how many 8259 (PIC) chips you'd need to service the above number of interrupts. Further, explain why only a total of 64 interrupts can be serviced with the help of cascading.

Memory Banks

1. [*4 points*] Explain in how many different ways data can be accessed from the Memory, assuming the memory is divided into even and odd banks? You must explain using the proper values of A0 and BHE' pins. Why does accessing 16-bit data with an odd starting address require 2 bus cycles instead of 1?

Timing Diagram

1**.** [*1 + 1.5 + 1.5 = 4 points*] Assume an 8086 has been set to operate at 30 Mhz and at 40% duty cycle. Calculate:

- Time for 1 clock pulse
- Time for 1 bus cycle
- Total time in nanoseconds each clock pulse stays low

2. [*4 points*] Draw the timing diagram of the Write cycle of an Intel 8086 that is trying to write data to an external I/O. Your diagram must show the states of the following pins:

- CLK
- A19-A16
- AD15- AD0
- M/IO'
- ALE

- WR’
- READY
- DEN’

Interrupt

1. [*2 points*] Calculate the locations of CS and IP of the ISR for the interrupt **TYPE 123**
2. [*2 points*] Suppose, the **CS** of the ISR of an interrupt is found to be in the memory location **2BBh**. What could be the type of the interrupt?