UNITED INTERNATIONAL UNIVERSITY (UIU)

Dept. of Computer Science & Engineering

Assignment 1

Course No: CSE 4325 Course Title: Microprocessor & MicroController

Marks: 20

1. Suppose, execution of a signed additional instruction (4F37H + 3012H) occurred, what would be the value of zero flag (ZF), sign flag (SF), parity flag (PF), overflow flag (OF), carry flag(CF) ? (2.5)
2. DS = 34A9H, BX = 8722H, BP = 45E4H
   To access the physical address in the data segment (DS), what should be the value of
   a. the segment register if the offset register holds the value of 7B85H.
   b. the segment register if the offset register holds the value of 45D2H.
   c. the offset register if the segment register holds the value of 7D92H.
   Justify whether your answer is valid or not. (3)
3. RAM[A] has a data bus of 8 bits and RAM[B] has a data bus of 16 bits. Both RAMs have a total memory capacity of 128 MB. What is the address bus width of each RAM? (3)
4. Transfer of bus control from processor to device takes 150 ns. But transfer of bus control from device to processor takes 550 ns. (3)
   a. One of the input-output devices employs DMA in burst mode and takes 13335083 ns to transfer 2048 bytes of data. What is the data transfer rate of the device? (1.5)
   b. Now in the cycle stealing mode, data transfer will begin with one byte at a time and in every consecutive/following cycle, one extra byte will transfer than the previous one. That means, in the first cycle one byte will transfer, in the second cycle two bytes will transfer, in the third cycle three bytes will transfer and, in this manner, data transfer will continue until all the required bytes are transferred. Suppose you need to transfer 7875 bytes of data in this cycle stealing mode. Calculate the time required to transfer the data in this mode. **[Consider the same data transfer rate that you got from the part (I)] [Hint: Try to build a series of the first n positive integers among the consecutive data transmission cycles]** (1.5)
5. Suppose execution of a signed instruction (8BCD H – 71AB H) occurred. What would be the value of the Carry flag (CF), Zero flag (ZF), Sign Flag (SF), Parity Flag (PF), and Overflow flag (OF)? (2.5)
6. Suppose the address 68E2H : 3B9AH has an instruction. To access this instruction, what should be the value of
   a. the segment register if the offset register holds the value of 4C5AH.
   b. the segment register if the offset register holds the value of 7D98H.
   c. the offset register if the segment register holds the value of 26FFH.
   Justify your answer. (3)
7. If two consecutive segments have the values of 8600H and 8601H, in total how many physical address slots exist in both of these segments that are not overlapping between both segments? (3)