MID ASSIGNMENT

Q:1 a. Briefly discuss the Parity and Auxiliary flag bits with the help of example.

Ans: Parity flag:

- Indicates even parity of the low 8bits of the result
  - PF is set if the lower 8bit contain even number 1 bit
  - For 16- and 32 bit values, only the least significant 8 bits are considered for computing parity value.

For Example

Mov AL, 53 53D = 0011 0101B

Add AL,89 89D = 0101 1001B

142D = 1000 1110B

As the result has even number of 1 bits, parity flag is set.

Auxiliary Flag:

- Indicates whether an operation produced a carry or borrow in the low-order 4 bits (nibble) of 8-, 16-, or 32- bit operand (i;e operand size doesn't matter)

For Example

Mov AL,43 43D = 0010 1011B

Add Al,94 94D = 0101 1110B

137D = 1000 1001B

As there is a carry from the lower nibble, auxiliary flag is set

B: What are the major differences between microprocessors and microcontrollers?

Ans: Microprocessors:

A microprocessor is a controlling unit of a micro-computer, fabricated on a small chip capable of performing ALU (Arithmetic Logical Unit) operation and communicating with the other devices connected to it.

Register array consists of registers identified by letters like B, C, D, E, H, L and accumulator.

The control Unit Controls the flow of data and instruction within the computer.

Microcontroller:

A microcontroller is a compact integrated circuit designed to govern a specific operation in an embedded system.

The microcontroller has many types of bit handling instruction.

This is concerned with the rapid movement of bits within the chip.

This can function as a computer without the addition of external parts.

This has additional features such as on-chip timers, parallel and series input-output and internal RAM and ROM.

Q:2 a. Define Volatile and Non Volatile memory?

Ans: Volatile Memory: Volatile memory is memory that electric current to retain data. When the power is turned off, all data is erased. Volatile memory is often contrasted with non-volatile memory which does not require power to maintain the data storage state.

Non Volatile Memory: Non-volatile memory (NVM) is a type of memory that retrains stored data after that the power is turned off. Unlike volatile memory, it does not require an electric charge to maintain the storage state. Only reading and writing data to Non-volatile memory requires power.

B. What is the purpose of MN/Mx pin? Explain.

Ans: MN/MX is an input pin used to select one of this mode. When MN/MX is high the 8086 operates in minimum mode. In this mode the 8086 is configured to support small single processor system using a few devices that the system bus. When MN/MX is low 8086 is configures to support multiprocessor system.

Define the minimum and maximum mode of 8086 microprocessor.

Ans: In minimum mode there can be only one processor I;e: 8086. In maximum mode there can be multiple processor with 8086, like 8087 and 8089. ALE for the latch is given by 8086 as it is the only processor in the circuit. ALE for the latch is given by 8288 bus controller as there can be multiple in the circuit.

Q 3: a Define the purpose of BIU and Execution Unit?

Ans: The 8086 CPU is organized as two separate processor, called the Bus interface Unit (BIU) and the Execution Unit (EU). The BIU provides H/W functions, including generation of the memory and I/O addresses for the transfer of data between the outside world outside the CPU.

B: What's the purpose of BHE pin of 8086 microprocessor?

Ans: BHE stands for Bus High Enable. It is available at pin 34 and used to indicate the transfer of data using data bus D8-D15. This signal is low during the first clock cycle, thereafter it is active.

BHE/S7 34 - BUS HIGH ENABLE/STATUS: During T1 the bus high enable signal (BHE) should be used to enable data onto the most significant half of the data bus, pins D15±D8. Eight-bit oriented devices tied to the upper half of the bus would normally use BHE to condition chip select functions. BHE is LOW during T1 for read, write, and interrupt acknowledge cycles when a byte is to be transferred on the high portion of the bus. The S7 status information is available during T2, T3, and T4. The signal is active LOW, and floats to 3-state OFF in `hold''. It is LOW during T1 for the first interrupt acknowledge cycle.