North East University Bangladesh
Dept. of CSE

Assignment: 4
course title: Microprocessor & Interfacing
course code: CSE-321

submitted to
Shahadat Hussain Parvez
Assistant Professor
Dept of CSE
North East University Bangladesh

submitted by
Md. Abdul Mutalib
ID: 1903030200001
semester: 9th
Dept: CSE

① Why is 8086 a 16 bit microprocessor?

The 8086 is a 16 bit microprocessor. The term '16-bit' means that it's arithematic Logic unit, internal registers and most of it's instruction are designed to work with 16-bit binary words.

The 8086 has a 16 bit data bus, so it can read data from or write data to memory and ports either 16 bits or 8 bits at a time. The ~~8086~~ The feature of 8086 microprocessor can generate 16 bit I/O address, hence it can access $2^{16} = 65536$ I/O ports. The 8086 ~~bit~~ provides fourteen 16-bit registers. The 8086 is possible to perform bit, byte, word and block operation. It perform arithematic and logical operation on bit, byte, word and decimal numbers including multiply and divide.

② What are the registers in 8086?

The general purpose registers are used to store tempory data in the time of different operations in microprocessor. 8086 has eight general purpose registers.

AX : This is the accumulator. It is 16-bit registers but it is divided into two 8-bit registers. These registers are AH and AL. AX generally used for arithematic or Logical instruction.

BX : BX is another register pair consisting of BH and BL. This register is used to store the offset values.

CX: CX is generally used as control register. It has two parts CH and CL.

DX: DX is data register. It has two parts are DH and DL.

SP: This is the stack pointer.

BP: BP is another 16-bit register.

SI: This is source index register

DI: This is destination index register.

③ What is the maximum amount of memory addressable by 8086 and why?

In 8086, an memory location is addressable by 20 bit address. The address bus is 20 bit address and the address bus is 20 bits. So, it can be address up to single mega byte (2^{20}) of memory space.

④ Why is queue important in microprocessor?

The 8086 instruction queue is a buffer that holds opcode bytes that have been prefetched by the bus interface unit. This speed up operation of the processor by helping to reduce fetchs latency. i.e. to improve the probability that an opcode byte fetched by the processor is already avilable.

⑤ What is the difference between maximum and minimum mode?

The difference between maximum & minimum mode is as follows:-

Maximum Mode	Minimum mode
① When MN/MX (bar) is low 8086 is in maximum mode	① When (MN/MX) bar is high 8086 is in minimum mode
② In maximum mode 8086 generates QS1, QS0, S0(bar) S1, (bar), S2 (bar), LOCK (bar), RQ (bar), GT1, RQ (bar)/ GT0 control signals.	② In minimum mode 8086 generates INTA (bar), AEE, DEN (bar), DT/R (bar), M/IO (bar), HLDA, HOLD and WR (bar). control signals.
③ There are multiple process in the system.	③ There is only one processor in the system minimum mode.
④ When the maximum mode interfacing master/ slave and multiplexing and several such control are required.	④ In minimum mode no interfacing or master/ slave signal is required.

→ ←