CSE 3107 | Microprocessor

Question Pattern

1. Introductory concepts + 8085 (2 – 2.5 Sets)
2. 8086 ( 3 – 3.5 Sets)
3. Advance Processor (80186 – 80486, Pentium) ( 1 – 1.5 Sets)

Lecture 01: Introduction to MP

1. Basic concepts of microprocessor and microprocessor based system.
2. Differences between microprocessor and microcontroller.
3. Different types of languages.

Lecture 02: History & Features of MP

1. Evaluation of MP: Moor’s law.
2. Math related to Moor’s law.
3. Processor Terminologies.
4. Cache, Clock – Speed, Instruction Set, Bus – Speed.
5. Multithreading, Multi Core, Hyper – Threading , Turbo – Boost.

Lecture 03: Introduction to 8085

1. Features of 8085.
2. Hardware and Programming Model of 8085.

Lecture 04: The Architecture of 8085

1. Functional Blocks of 8085 Architecture.
2. 8085 Bus Structure.
3. Functionalities of Different Pins: ALE, X1, X2, RESETIN’, SID, SOD, READY, HOLD, etc.

Lecture 05: Instruction Sets of 8085

1. Problem will be given and you have to write 8085 instructions to solve it. \*\*\*\*
2. Instruction Format.
3. Different Addressing Modes.

Lecture 06: Timing Diagram of 8085

1. Instruction Cycle, Machine Cycle and T – State.
2. Instructions will be given and you have to draw the timing diagram showing contents of Address Bus, Data Bus and Different Control Signals.
3. Practice instructions from Quiz # 2 questions and given practice sheet. \*\*\*

Lecture 07: Counter and Time Delays

1. Calculating total delay of a given assembly code.
2. Calculating the value of the loop counter to produce desired amount of delay.
3. Example problems: Hexadecimal counter, Modulo ten counter, Generating square wave.

Lecture 08: Interfacing I/O devices

1. Differences between Memory mapped I/O and I/O mapped I/O.
2. Timing diagram of IN and OUT instructions.
3. Example 1 and 2.

Lecture 09: Stack & Subroutine

1. Initializing stack.
2. PUSH and POP instructions.
3. Determining contains of Stack memory and registers after performing different operations (push and pop) on Stack. See example 9.2. [Solution has already been uploaded in FB group].
4. CALL and RET instructions.
5. Data transfer during CALL and RET instructions. [Data Transfer Table]
6. Passing data to a subroutine [Traffic signal control example]

Lecture 10: 8085 Interrupt

1. Classification of Interrupt.
2. Eight steps of Interrupt process.
3. RST instruction.
4. Example 1.
5. Manipulating Interrupt Mask: SIM instruction.
6. Determining the current mask settings: RIM instruction.
7. Example of slide 33.

Lecture 11: Introduction to 8086

1. Features of 8086 microprocessor.
2. Word read and Byte read in 8086.
3. Block diagram of 8086 and functionalities of BIU and EU.
4. Memory address calculation.
5. Stack of 8086.
6. Operations on Stack (push and pop).

Lecture 13: Constructing Machine Code for 8086

1. Practice problems similar to lab tasks.
2. Solve question no 1 of Lab final exam.

8086 Flag Registers

1. Signed and Unsigned overflow.
2. Overflow flag vs. Carry flag.
3. Effect on different flags after execution of given instructions.
4. Practice problems similar to Quiz # 4
5. TF, IF and DF

8086 Addressing Mode

1. Identifying addressing mode of source and/or destination operand.
2. Calculating Effective address and Physical address for different addressing mode.
3. Re – writing code from one addressing mode to another addressing mode.

8086 Pin Description and Operation Modes

1. Functionalities of different pins.
2. Differences between Maximum mode and Minimum mode of 8086.
3. Maximum and Minimum mode configuration.
4. Timing diagram for Read/Write operation for Maximum/Minimum mode.

8086 Interrupt

1. Classification of 8086 Interrupt.
2. 8086 Interrupt processing.
3. Interrupt Vector Table (IVT)
4. Calculating call location of Interrupt Service Routine (ISR) from Interrupt number. [If you have any problem to understand this topic feel free to contact me.]

Advance Processors

1. Features of Intel 80186 / 80286 / 80386 / 80486 / Pentium processors.
2. Different Registers of Pentium Processor.
3. Differences between Real mode and Protected mode of Pentium Processor.
4. Calculating memory address in Protected mode.
5. Details of different fields of a Selector.
6. Details of different fields of a Descriptor.
7. Calculating memory location of a segment.
8. Practice problems similar to previous year questions.

Interfacing with 7- Segment FND through 8255

1. You will get this slide in course website in the folder **I/O Interfacing of 8086 using 8255**
2. Introduction to 8255.
3. slides 3, 5, 7, 8, 9, 12 – 18
4. Practice codes similar to lab tasks.

Interfacing with Dot Matrix Display through 8255

1. You will get this slide in course website in the folder **I/O Interfacing of 8086 using 8255**
2. Introduction to dot matrix display. [slide 2]
3. Slides 9 – 16.
4. Practice problems similar to lab tasks.