Guidelines for Final Exam

CSE 3107 | Microprocessor

Question Pattern

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

Lecture 01: Introduction to MP

- Basic concepts of microprocessor and microprocessor based system.
- Differences between microprocessor and microcontroller.
- Different types of languages.

Lecture 02: History & Features of MP

- Evaluation of MP: Moor's law.
- Math related to Moor's law.
- Processor Terminologies.
- Cache, Clock – Speed, Instruction Set, Bus – Speed.
- Multithreading, Multi Core, Hyper – Threading , Turbo – Boost.

Lecture 03: Introduction to 8085

- Features of 8085.
- Hardware and Programming Model of 8085.

Lecture 04: The Architecture of 8085

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

Lecture 05: Instruction Sets of 8085

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

Lecture 06: Timing Diagram of 8085

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

Lecture 07: Counter and Time Delays

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

Lecture 08: Interfacing I/O devices

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

Lecture 09: Stack & Subroutine

- Initializing stack.
- PUSH and POP instructions.
- 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].
- CALL and RET instructions.
- Data transfer during CALL and RET instructions. [Data Transfer Table]
- Passing data to a subroutine [Traffic signal control example]

Lecture 10: 8085 Interrupt

- Classification of Interrupt.
- Eight steps of Interrupt process.
- RST instruction.
- Example 1.
- Manipulating Interrupt Mask: SIM instruction.
- Determining the current mask settings: RIM instruction.
- Example of slide 33.

Lecture 11: Introduction to 8086

- Features of 8086 microprocessor.
- Word read and Byte read in 8086.
- Block diagram of 8086 and functionalities of BIU and EU.
- Memory address calculation.
- Stack of 8086.
- Operations on Stack (push and pop).

Lecture 13: Constructing Machine Code for 8086

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

8086 Flag Registers

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

8086 Addressing Mode

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

8086 Pin Description and Operation Modes

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

8086 Interrupt

- Classification of 8086 Interrupt.
- 8086 Interrupt processing.
- Interrupt Vector Table (IVT)
- 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

- Features of Intel 80186 / 80286 / 80386 / 80486 / Pentium processors.
- Different Registers of Pentium Processor.
- Differences between Real mode and Protected mode of Pentium Processor.
- Calculating memory address in Protected mode.
- Details of different fields of a Selector.
- Details of different fields of a Descriptor.
- Calculating memory location of a segment.
- Practice problems similar to previous year questions. ***

Interfacing with 7- Segment FND through 8255

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

Interfacing with Dot Matrix Display through 8255

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