Department of Electrical Engineering
Motilal Nehru National Institute of Technology, Allahabad
End Semester Examination
VI Semester, Electrical Engg.

(EE-1602) – Microcontroller & Computer Organization

Duration: 3.0 Hr | **Date: 03rd-May-2016** | **M.M. 40**

Q1. Explain the difference between (Any Four) [6]

- Instruction Cycle and Machine Cycle.
- Stack Pointer and Program Counter.
- RISC Processor and CISC Processor.
- I/O Mapped I/O and Memory Mapped I/O.
- Microprocessor and Microcontroller.
- Absolute and partial decoding.

Q2. Design an interfacing circuit using 8155 PPI to read and display from an A/D converter to meet the following requirements: [5]

a) Set up port A in the handshake mode to read data from an A/D converter.
b) Set up port B as an output port to display data at seven segment LED's.
c) Use line PC_7 from port C to initiate a conversion.
d) Design a decode logic to assign I/O ports addresses.
e) Use the 8155 timer to record the conversion time.

Q3. Specify the various handshake signals and their functions, when 8255 PPI is configured to operate in mode 1. [2]

Q4. Draw the block diagram of 8259A programmable interrupt controller. Explain the different modes in which 8259 can operate and discuss how 8259A is initialized. [5]

Q5. Given two sets of reading write a program to check whether each reading from the first set is higher than the corresponding reading from the second set. If all the readings from the first set are higher than the corresponding reading from second set turn on the bit D_0 of the PORT1. If any one of the readings of the first set is lower than the corresponding reading of the second set, stop the process and output FF as an emergency signal to the PORT1. [4]

Q6. Write a program to divide the 16 bit number by 08 bit number. [3]

Q7. a) Draw the block diagram of 8086 and explain the main features. Describe the flag register of 8086 and explain the difference between the flag register of 8085 and 8086. [4]
b) Describe the addressing technique used in 8086 and explain the various addressing modes of 8086. [3]

Q8. Design a seven segment LED output port with the device address F5 H, using a 74LS138 3-to-8 decoder, a 74LS20 4-input NAND gate, a 74LS02 NOR gate, and a common anode seven segment LED. Given WR and IO/$\overline{M}$ signals from 8085 generate the IOW control signal. Write the instructions to display digit 7 at the port. [4]

Q9. Draw the Block Diagram of 8237 PPI (DMA Controller) and explain how the 8237 PPI transfers 64K bytes of data per channel with eight address lines. [4]