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Department of Computer Science & Engineering

B. Sc. in Electronics & Communication Engineering (B. Sc. ECE)

Semester Final Examination 2016 (Jan-Jun)

Level 3 Semester I, Course Code: CSE 317, Credit: 3.0

Course Title: Microprocessor and Embedded System Design



Time: 3 Hours

Total Marks: 90

Figure on the right side indicates the mark for the respective question.

Section – A

Answer any three questions from this section.

- | | | |
|-------|--|-------------|
| 1.(a) | Briefly describe RISC processors and their key features. | 5 |
| (b) | Write initialization instructions for the 8259A Interrupt Controller to meet the following specifications:
i. Interrupt vector address 2090H
ii. Call address interval of eight bits
iii. Nested mode | 5 |
| (c) | Describe the following two signals for multiprocessor environment (8086/8088): \overline{MN} / \overline{MX} and TEST. | 2x2.5
=5 |
| 2.(a) | List the major components of the 8259A interrupt controller and explain their functions. | 6 |
| (b) | Briefly describe Intel MCSR-51 single-chip micro-controller. | 6 |
| (c) | Discuss the various flags used in flag register of 8086 microprocessor. | 3 |
| 3.(a) | What is a programmable interface device? | 2 |
| (b) | Describe 8255 PPI mode 1 output control signals, timing waveforms, bit format of control and status words. | 4x2
=8 |
| (c) | Assuming the 8085 microprocessor is completing an RST 7.5 interrupt request, check to see if RST 5.5 is pending. If it is pending, enable RST 5.5 without affecting any other interrupts, otherwise, return to the main program. | 5 |
| 4.(a) | Assemble the following program (memory layout), starting with the memory address 2020H.
MVI A, 8FH
MVI B, 68H
SUB B
ANI 0FH
STA 2070H
HLT | 4 |
| (b) | Briefly describe the architecture of Math co-processor 8087. | 5 |
| (c) | Briefly describe about conditional call and conditional return statements. | 3+3
=6 |

Section – B

Answer any three questions from this section.

- 1.(a) Define microprocessor in terms of a programmable device. 2
- (b) The 8085 instructions can be classified into the following five functional categories: data transfer, arithmetic, logical, branching and machine-control operations. For each category, provide appropriate assembly code along with short description. 5x2 =10
- (c) Write 8085 instructions to read the data at input PORT 07H and at PORT 08H. Display the input data from PORT 07H at output PORT 00H, and store the input data from PORT 08H in register B. 3
- 2.(a) 8085 microprocessor has dedicated address and data bus. Justify your answer. 5
- (b) What is a 'machine cycle' in a microprocessor? 2
- (c) Explain the machine cycles of the following 3-byte instruction when it is executed. 8
- | Opcode | Operand | Bytes | Machine-Cycles | T-States | Operation |
|--------|---------|-------|----------------|----------|---|
| STA | 2065H | 3 | 4 | 13 | (Stores accumulator in memory location 2065H) |
- 3.(a) Briefly describe about Restart (RST) instruction of 8085 microprocessor. 3
- (b) Describe the eight steps interrupt process of 8085 microprocessor when the interrupt signal INTR goes high. 7
- (c) Differentiate between memory-mapped I/O and peripheral I/O. 5
- 4.(a) Explain various addressing modes of 8086. 4
- (b) Describe BSR mode along with its control word format of 8255A PPI. 3
- (c) Describe 8255 PPI mode 1 input control signals, timing waveforms, bit format of control and status words. 4x2 =8