Roll Number:_____

Thapar Institute of Engineering & Technology, Patiala

Department of Computer Science and Engineering

END SEMESTER EXAMINATION

B. E. (Third Year): Semester-VI (2018/19)	Course Code: UCS617 Course Name: Microprocessor Based Systems Design
May 17, 2019	Friday, 14:00-17:00 Hrs
Time: 3 Hours, M. Marks: 100	Name of Faculty: ANJ, MJU, ANA, HRS, RAH, MKA, RAC, SVS

Note: Attempt all questions in sequence with proper justification. Assume missing data, if any, suitably.

Q1(a) Identify the register contents and flag status in 8085 as the following instructions are executed: (5)

	A	B	S	Z	CY
SUB A					
MOV B, A					
DCR B					
INR B					
SUI 01H					
HLT					

Q1(b) Write an assembly language program in 8085 to separate even numbers from the given list of 50 numbers and store them in another list starting from 2300H. Assume the starting address of 50 number list is 2200H. (5)

Q1(c) Compare the following pairs of instructions in 8085 with their operations, instruction size, machine cycle, addressing modes and affected flags: (10)

i. XTHL and SPHL

ii. MVI A, 00H and XRA A

iii. SUB B and CMP B

iv. LDA 2000H and LHLD 2000H

Q2(a) Write an assembly language program in 8086 to find the largest word from the 100 words present in the memory from address 76000H and store the result in register BX. (6)

Q2(b) Assume that if SS=3500H and SP is FFFEH. (4)

i. Calculate the physical address of the stack.
ii. Calculate the lower range of the stack segment.
iii. Calculate the upper range of the stack segment.
iv. What will be the representation of logical address?

Q2(c) Write down the description of the following Assembler Directives in 8086 along with example: (2)

i. DB 100 DUP (?)
ii. ORG $

iii. DW 0ABCDH
iv. MOV SI, OFFSET ADDR

Q2(d) Discuss the following instructions with suitable example in 8086: (8)
i. CMPSW
ii. LOOPZ
iii. AAA
iv. DAS

Q3(a) Describe the Interrupt structure of 8086 Microprocessor. (6)

Q3(b) i. Write an assembly language program to interface 8255 with 8086 to set PC_6, PC_2 and PC_4 bits of Port C and reset them after 40ms. (6+4)
ii. Write an assembly language program using 8255 PPI: Port A as input in mode 0, Port B as input in mode 1. The address of control word register is 81507.

Q3(c) Differentiate between minimum mode and maximum mode of 8086 microprocessor. (4)

Q4(a) Write a program in ARM assembly language to count the number of 1's and 0's in a given byte. (6)

Q4(b) Write down the instruction format of Current Program Status Register along with Exception and Interrupt Modes which have been associated with interrupt sources and their own register sets. (6)

Q4(c) Write down the ARM equivalent code for the following programs: (4+4)

i.	**ii.**

int x,y;
...
if (x >0) {
y=1;
} else {
y=2;
}
return y;
	int x,y;
	...
	y=1;
	while (x >0) {
	y*=x;
	x --;
	}
	return y;

Q5(a) Draw and explain the core data flow model for ARM Processor. (4)

Q5(b) Show the sequence of operations of Programmable Interrupt Controller with 8086 microprocessor. (8)

Q5(c) Draw and Explain the functional block diagram of PIT 8253/8254. (8)