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THAPAR INSTITUTE OF ENGINEERING AND TECHNOLOGY, PATIALA

Department of Computer Science and Engineering

END SEMESTER EXAMINATION, DECEMBER 2019

Course Code: UCS617	**Course Name**: Microprocessor Based Systems Design
Class/Sem: B.E.-M.B.A (Third Year)/ VI sem	**Course Instructor**: Ms. Harinder Kaur
Exam Date: 5 Dec, 2019	**Exam Time:** 14:00 hrs
Time allotted: 3 hrs	**Marks:** 100

- All questions are compulsory
- Assume standard values of data, wherever required.

1(a)(i) The contents of Register (BL) and Register (AL) of 8085 microprocessor are 49H and 3AH respectively. What are contents of AL, the status of carry flag (CF) and sign flag (SF) after executing 'SUB AL, BL' assembly language instruction? (ii) In 8085 microprocessor, what is the output of following program? LDA 8000H MVI B, 30H ADD B STA 8001H	6
1(b) Explain the following instructions of 8085 with suitable example:- (i) LDAX (ii) LXI (iii) LHLD (iv) STAX (v) SHLD (vi) XCHG	6
1(c) Write an assembly language program in 8085 for the following:- (i) Write program to convert a BCD number into its equivalent binary in 8085. (ii) Write 8085 program to multiply two 16-bit numbers.	6*2=12
2(a) Explain the working of BIU and EU unit of 8086 microprocessor with neat and Clean block diagram.	8
2(b) Identify the operand addressing mode in each of the following:- (i) MOV DX,[DI] (ii) MOV AX, TABLE[BX] (iii) MOV CX, 27H (iv) MOV [BP], BX (v) MOV BL,AL (vi) MOV VAR, AX	6

2(c) Registers AX, BX, CX, DX contain the values 1111h, 2222h, 3333h and 4444h. What are the contents of each register after the following sequence of instructions has executed? push ax push cx push bx push dx pop ax pop cx pop bx pop dx	2
3(a) Draw and explain the functional block diagram of PIT 8253/8254	8
3(b) Write an assembly language program to interface 8255 with 8086 to set PC6, PC2 and PC4 bits of port C and reset them after 40 ms.	4
3(c) With reference to the 8259 PIC, explain the following terms:- (i) Interrupt Request Register (ii)In-Service Register (iii) Interrupt Mask Register (iv) Cascade buffer/Comparator	8
4(a) Differentiate the following terms:- (i) CPSR and SPSR (ii) ARM Instruction and Thumb Instruction (iii) Branch and branch with Link (iv) IRQ and FIQ mode of ARM (v) Synchronous and Asynchronous Communication	5*3=15
4(b) Explain the following ARM instructions with examples:- (i) B,BL (ii) BX, BLX (iii) ADDEQ (iv) SWI (v) MLA	5
5 (a) Discuss 3-stage pipelining in ARM with suitable examples and pipeline hazards.	5
5 (b) Write ARM code for the following:- (i) Write ARM code for counting number of 1's and 0's in a byte. (ii) Write ARM code for getting largest number in an array.	10
5 (c) Explain exception handling mechanism in the ARM in detail.	5