JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2024

B.Tech-VI Semester (ECE)

COURSE CODE(CREDITS):18B11EC512 MAX. MARKS: 15

COURSE NAME: Microprocessor and Interfacing

COURSE INSTRUCTORS: Dr. Shweta Pandit

MAX. TIME: 1 Hour

Note: (a)*All questions are compulsory.*

(b)Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

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Q1. a) Provide a neat sketch of internal architecture of 8086 microprocessor. What is the role of Bus Interface Unit (BIU) and Execution Unit (EU) of 8086 microprocessor? Explain the complete execution process of the ADD AX, CX instruction across the different components of the 8086 microprocessor. **[3][CO-1]**

b) What is the purpose of segment registers in real-addressing mode and why we cannot use a single register to access memory location in 8086 microprocessor? **[1][CO-1]**

Q2. a) Provide the format of IEEE single-precision floating-point standard representation. Convert following decimal numbers into single-precision floating-point numbers: **[1+1][CO-1]**

(i) -1.75 (ii) +1200

b) Suppose that DS = 0100H, SS = 1000H, AX=0200, BX=0400, BP = 1000H, SI=3000, and DI = 0050H. Determine the addressing mode and memory address accessed by each of the following instructions, assuming real mode operation: **[2][CO-1]**

(i) MOV BL,[BP+DI] (ii) MOV CX,[DI]

(iii) MOV DH,[EBX+4*EAX+1000H] (iv) MOV AL,[SI-0100H]

Q3. a) What is wrong with a MOV [BX],[DI] instruction and what does the symbol [] denotes in an instruction? **[1][CO-2]**

b) If the following instructions appear in a program for the 8086 microprocessor, what are their machine language equivalents? **[2][CO-2]**

(i) MOV SI,[AX] (ii) MOV BL,[1234]

c) Convert 884B00H from machine language to assembly language. **[1][CO-2]**

(Note: Opcode for MOV is 100010; Use tables given below for part b) and c) of Q3.)

MOD	*Function*
00	No displacement
01	8-bit sign-extendec displacement
10	32 bit signed displacement
11	R/M is a register

Code	*W = 0 (Byte)*	*W = 1 (Word)*	*W = 1 (Doubleword)*
000	AL	AX	EAX
001	CL	CX	ECX
010	DL	DX	EDX
011	BL	BX	EBX
100	AH	SP	ESP
101	CH	BP	EBP
110	DH	SI	ESI
111	BH	DI	EDI

R/M Code	Addressing Mode
000	DS:[BX+SI]
001	DS:[BX+DI]
010	SS:[BP+SI]
011	SS:[BP+DI]
100	DS:[SI]
101	DS:[DI]
110	SS:[BP]*
111	DS:[BX]

*Note: Special addressing Mode

Q4. a) Explain what happens when the PUSH BX instruction executes. Make sure to show where BH and BL are stored along with proper diagram. (Assume that SP = 0100H and SS=0200). **[2][CO-2]**

b) What is the purpose of the direction flag? **[0.5][CO-2]**

c) What is the difference between the LDS and LSS instructions? **[0.5][CO-2]**