JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATIONS-2023

B.Tech-IV Semester (ECM)

COURSE CODE (CREDITS): 20B11EM411(4)   MAX. MARKS: 15

COURSE NAME: Microprocessor, Microcontrollers and Interfacing Techniques

COURSE INSTRUCTORS: Dr. Shweta Pandit   MAX. TIME: 1 Hour

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1. a) Convert the following decimal numbers into single-precision floating-point numbers.
    (i)   -1234H   (ii) +33.648H   [1][CO-1]
  b) What is the purpose of segment registers in the real mode operation of the microprocessor? Elaborate
                                                                               [1.5][CO-1]
c) Determine the effective address accessed by the following register combinations in 8086 microprocessor based system:
    (i) DS=1239 AX=3000H (ii) SS = 8000H and SP = 9000H (iii) DS = C000H and SI = A000H
    (iv) DS = 1A00H and CX = A900H   [2][CO-1]

Q2. a) Give the block diagram of computer system showing the address, data and control bus structure. Explain the process of data transfer through microprocessor to input/output and memory devices connected to the computer system with the help of these buses.   [1+2][CO-1]
  b) Suppose that DS = 1100H, SS=1000H, BX = 0400H, AX=2000H, LIST = 0050H, and SI = 0300H. Determine the addressing mode and address accessed by each of the following instructions, assuming real mode operation:
    (i) MOV LIST[SI], CX (ii) MOV DH,[BX+4*SI+1769H]   [2][CO-1]

Q3. a) In the real mode. show the starting and ending addresses of each segment located by the following segment register values:
    (i) ABCDH (ii) 00FFH (iii) 2478H (iv) EFD0H   [1][CO-1]
  b) Which register or registers are used as an offset address for the string instruction in the microprocessor?
                                                                               [0.5][CO-2]

Q4. a) Find the machine language equivalent of the MOV AX, [DI+289AH] instruction.   [2][CO-2]
    b) Convert 887E034BH from machine language to assembly language.   [2] [CO-2]
(Note: Opcode for MOV is 100010; solve by mentioning the different fields of 16-bit instruction format; Use tables given below for question 4.)

MOD	Function
00	No displacement
01	8-bit sign-extended 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