

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
TEST-1 EXAMINATION – February 2018  
B.Tech, IV<sup>th</sup> Semester ( CSE )

COURSE CODE: 10B11CI401

MAX. MARKS: 15

COURSE NAME: MICROPROCESSORS AND CONTROLLERS

COURSE CREDITS: 4

MAX. TIME: One Hr

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Missing data, if any, can be appropriately assumed.*

- 1(a) Convert the following single-precision floating-point numbers into decimal numbers (1)  
(i) 01000001001100000000000000000000 (ii) 9F54 0000H
- (b) If DS=2000H, SS=4000H, BP=0500H, and DI=0700H. Determine the memory address accessed by each of the following instructions, assuming real mode operation: (1)  
(i) MOV DX, [DI+100H] (ii) MOV CX, [BP-100H]
- (c) With a neat sketch explain the architecture of 8086 microprocessor (3)
- 2(a) Give the 16bit instruction format used by 8086. Clearly indicate its different fields. (1)
- (b) Find the machine language equivalent of the following instructions: (1)  
(Hint: Opcode for MOV is 100010; Use tables given below to generate machine code)  
(i) MOV AX, [BX] (ii) MOV [2000H], DI

MOD	Function			RM Code	Addressing Mode
00	No displacement			000	DS:[BX+SI]
01	8-bit sign-extended displacement			001	DS:[BX+DI]
10	32-bit signed displacement			010	SS:[BP+SI]
11	R/M is a register			011	SS:[BP+DI]
				100	DS:[SI]
				101	DS:[DI]
				110	SS:[BP]*
				111	DS:[BX]

  

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

\*Note: Special Addressing Mode

- (c) Write an assembly language program for 8086 based system to fill 10 bytes of the memory location starting from 1000:1000H with 07H and next 16 bytes with 04H. Write appropriate comments for your program. (3)
- 3(a) Differentiate between the following commands. (2)  
(i) SUB and CMP (ii) MUL and IMUL
- (b) An 8086 microprocessor based system controls the pump that is used to fill a water tank. The length, breadth and height of the water tank are stored at memory locations, 1000:0100H, 1000:0101H and 1000:0102H respectively. The water flow rate of the pump is stored at memory location 1000:0103H. Write an assembly level program to find the time required to fill the water tank. Give proper comments for your program. (3)