Question Paper

Exam Date & Time: 02-Jun-2018 (09:30 AM - 12:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES IV SEMESTER B.S. DEGREE MAKE-UP EXAMINATION-MAY/JUNE 2018 DATE: 2 JUNE 2018 TIME: 9.30 AM TO 12.30 PM

Microprocessor and Microcontroller [EC 246]

Marks: 100

Duration: 180 mins.

Answer ANY FIVE full questions. Missing data may be suitably assumed.Write comments or explain the logic for all the programming questions.

1) Explain the programming model of 8086 microprocessor (10)with a neat diagram. A) B) (6) With proper illustration, explain the following instructions of 8051. Write the addressing mode/s supported by of each of these instructions. i) DINZ ii) DAA iii) SWAP C) (4) Identify the addressing mode and calculate the physical address that is accessed in each of the following instruction, given, DS = 2100H, CS = 8A00H, SS = 4800H, BX = 1100H, SI = A000H, DI = BA00H.i) MOV AX, [BX + 20H] ii) MOV BX, [SI + 45H] 2) (8) With illustration, explain memory segmentation in 8086. List its advantages. A) B) (12)Identify the addressing mode used in each of the following instruction of 8051 and explain the function of each instruction. i) MOV B, #23 ii) MOVC A, @A+DPTR iii) XCH A, RO iv) MOV 2, 3 v) PUSH 0E0H vi) MOV 40H, #25H

3)	A)	Explain the following data definition directives showing memory sketches, with examples for each.	(6)
	B)	Explain the following pseudo-instructions with examples for each. i) PTR ii) EQU	(4)
	C)	Write a program for 8086 to multiply 2-digit BCD numbers and store the result in memory. Assume the two BCD numbers are also in memory.	(10)
4)	A)	Write steps for programming counter of 8051 in mode-1. Write a program to send two digit hexadecimal down count value to port-1, with a delay of 0.02 seconds. Use timer-0 in mode-1 to generate the delay (assume crystal frequency= 11.0592MHz).	(10)
	Β)	Write a program for 8051 to find the sum of 100, 8-bit unsigned numbers stored in the array starting from 7000H onwards. Store the result at 8050H onwards. Store the code from E000H onwards.	(10)
5)	A)	Write a program for 8086 to add two 8-digit BCD number stored in memory and store the result in memory. Use the data segment definition as given below for writing the program. .data	(10)
		x DB 12H, 87H, 34H, 75H ; x = 12873475 y DB 48H, 98H, 06H, 90H ; y = 48980690 z DB 0,0,0,0,0	
	Β)	Write a program for 8086 to find the largest number in an array of 8-bit unsigned hexadecimal numbers stored in memory. Length of array is 100. Write the result in memory.	(10)
6)	A)	Explain the function of the following pins in 8051. Write the direction of each of the signal. i) RESET ii) ALE iii) $\underset{EA}{PSEN}$ iv) $\underset{EA}{EA}$	(10)
	B)	v) T0 and T1 Explain briefly the steps for initialising and starting a counter in 8051. Write a program for 8051 for counting the pulses appearing at the pulse input pin of counter-0. Display the count value in hexadecimal on port-2.	(10)
7)			(10)

With neat diagram, explain the pin structure of port-1 of

- ^{A)} 8051. Explain the steps for reading a logic '1' from the 'port pin' input of port-1.
- ^{B)} With a neat internal block diagram, explain the hardware ⁽¹⁰⁾ architecture of 8051.
- ⁸⁾ Explain unconditional branch instructions supported by ⁽⁵⁾
 ⁸⁾ 8051 microcontroller.
 - ^{B)} Explain the interrupt organization of 8051. Write the IVT ⁽⁵⁾ and IE register bit format of 8051.
 - ^{C)} Write a program for 8051 to add 100, 2-digit BCD numbers ⁽¹⁰⁾ that are stored at memory location 4000H onwards. Store the results in memory location AB00H onwards.

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