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15EC42

Fourth Semester B.E. Degree Examination, Aug./Sept.2020
Microprocessor

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Draw the internal architecture of the 8086 and explain briefly. **(08 Marks)**

b. Define offset address, effective address and physical address. If DS = 1000, offset (displacement) = 5000 H, [AX] = 1000H, [BX] = 2000H, [SI] = 3000H, [DI] = 4000H, [BP] = 5000H, [SP] = 6000H, [CS] = 0000H, [DS] = 1000H, [SS] = 2000H, [IP] = 7000H, then effective address of the following instructions:
(i) MOV AX, [5000H] (ii) MOV AX, 5000 [BX] [SI] **(08 Marks)**

OR

2 a. Explain Move instruction format, generate machine code for following instructions assuming the opcode for MOV as 100010.
(i) MOV AX, [BX] (ii) MOV AL, [SI + 05H] **(10 Marks)**

b. Write the single instruction equivalent for the following program if available and justify your answer; assume these programs segments are starting from memory location FFF0h and 8086 is reset just before execution.

(i) FFF0 : MOV CL, 10h
XCHG AX, BX
ROR AX, CL
XCHG AX, BX

(ii) FFF0 : PUSH Ax
PUSH Bx
POP Ax
POP Bx

(06 Marks)

Module-2

3 a. Write a program to given string is palindrome or not. **(08 Marks)**

b. What is an assembler directives? Explain ALLIGN, MACRO and ENDM, SEGMENT and Ends. **(08 Marks)**

OR

4 a. Use appropriate logic instructions that do following:
(i) Set (1) rightmost four bite of Ax
(ii) Clear (0) leftmost three bite of Ax
(iii) Invert 7, 8, 9th bit of Ax
(iv) Clear the register Ax **(04 Marks)**

b. What is wrong with following instruction:
(i) POP CS (ii) MOV [AX], 20H
(iii) MOV SS, DS (iv) MOV BL, SI **(04 Marks)**

c. Write a program to set parity flag, auxiliary flag, carry flag, overflow flag, interrupt flag and trap flags, and reset them after certain delay. **(08 Marks)**

Module-3

5 a. Write a program to change a sequence of sixteen two byte numbers from ascending to descending order the numbers are stored in the data segment, store the new series at address starting from 6000 H. Use LIFO property of the stack. **(08 Marks)**

b. Briefly explain non maskable interrupt and maskable interrupt (INTR). **(08 Marks)**

OR

6 a. Differentiate between macros and procedures. **(06 Marks)**

b. Write a MACRO function:
(i) To read a character with echo
(ii) To display a character
(iii) To read a character without echo
(iv) To display a text message
(v) To read a string of characters from keyboard. **(10 Marks)**

Module-4

7 a. Write a note on physical memory organization of 8086. **(06 Marks)**

b. Draw the timing diagram to execute memory read operation in an inlet 8086 processor. **(04 Marks)**

c. Bring out the differences between minimum mode and maximum mode of 8086. **(06 Marks)**

OR

8 a. Explain the block schematic of 8255. **(08 Marks)**

b. Write a program for seven segment display using 8255. **(08 Marks)**

Module-5

9 a. List the features of ADC 0808/0809 and write a flow chart for analog to digital conversion using ADC 0808. **(08 Marks)**

b. Write a program to rotate stepper motor by 360° in clockwise direction. **(08 Marks)**

OR

10 a. Explain the architecture of 8087 with the help of neat block diagram. **(08 Marks)**

b. Briefly explain Timer 8253/8254 modes. **(08 Marks)**

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