CBCS SCHEME

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15EC42

Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Microprocessors

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. Explain the flag register of 8086 in detail with neat diagram. **(08 Marks)**

b. Explain in detail with examples any 4 addressing modes of 8086. **(06 Marks)**

c. Opcode for MOV instruction is "100010", explain the formation of opcode for MOV AX, BX. **(02 Marks)**

OR

2 a. With a neat block diagram explain the internal architecture of 8086. **(08 Marks)**

b. Write an 8086 assembly language program to sort a block of 20 eight bit numbers at LOC1 into even and odd numbers, save them at EVN and ODD. **(06 Marks)**

c. Explain the working of following 8086 instructions:
(i) MOV AX, [SI] (ii) ADD BYTE PTR [DI], 3 **(02 Marks)**

Module-2

3 a. Write an ALP to add two ASCII numbers N1 and N2 and save the result at RES as a hexadecimal number. **(08 Marks)**

b. Write an ALP to replace the "##" in a given string of 50 characters with "**". **(08 Marks)**

OR

4 a. What are assembler directives? Explain the following assembler directives :
(i) DQ (ii) ASSUME (iii) DUP. **(04 Marks)**

b. Write an ALP to copy a 100 Byte block of data from LOC1 to LOC2 using the MOVS instruction. **(06 Marks)**

c. A two digit BCD number is typed using a keyboard. Write an ALP to read the value, save it as BCD number at LOC as packed BCD. **(06 Marks)**

Module-3

5 a. Describe the purpose of the interrupt vector table of 8086 processor and conditions which cause the following interrupts Type 0; Type 2; Type 4. **(08 Marks)**

b. What are the differences between MACRO and PROCEDURE? **(04 Marks)**

c. Write a procedure DELAY which performs 10 msec delay with 8086 processor @ 10MHz. Show the calculations of the delay. **(04 Marks)**

OR

6 a. Explain the type of interrupts and the action taken by the 8086 when an interrupt occurs in detail. **(06 Marks)**

b. Explain the interrupt acknowledgement cycle of 8086 with the neat timing diagram. **(06 Marks)**

c. Write a MACRO to create a DELAY where the delay parameter is passed on to the macro. **(04 Marks)**

Module-4

7 a. With a neat diagram explain the control register of 8255 in detail. **(06 Marks)**

b. Write ALP to setup 8255 so that port A is input port B is output and PC0-3 are input, PC4-7 are output ports. Assume 8255 is mapped as IO at 40H. Show with neat diagram the hardware connection of 8086 to 8255 using 74LS138 decoder to generate $\overline{CS}$ logic. **(10 Marks)**

OR

8 a. With neat diagram explain maximum mode of operation of 8086. **(06 Marks)**

b. 8086 is interfaced through a 8255 to a 4 by 4 keypad where Port C4-7 is connected to column and PC0-3 to row. 8255 is in isolated IO mode at location 40H. Write ALP to setup 8255 and read the key pressed to display on screen as "ROW#: __" and "COLUMN#:__". Assume a 50 msec delay routine DELAY50 is available to you. **(10 Marks)**

Module-5

9 a. Explain the internal architecture of 8087. **(06 Marks)**

b. Write a program to read analog input connected to the last channel of ADC0808 interfaced to 8086 using 8255 and digital value to be stored at location 3000h. **(06 Marks)**

c. Explain the working of DOS21H interrupt when AH = 09h and AH = 02h. **(04 Marks)**

OR

10 a. Write an ALP to rotate 100 steps in clockwise direction for a 1.8 degree stepper motor connected to 8255 port. Show details of calculations. Motor to rotate at 12 rpm. Processor speed is 10 MHz. **(08 Marks)**

b. Explain the control register of 8253/54 in detail. **(06 Marks)**

c. Explain the difference between CISC and RISC Architecture. **(02 Marks)**

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