17EC46

USN

Fourth Semester B.E. Degree Examination, Dec.2024/Jan.2025
Microprocessors

Time: 3 hrs.

Max. Marks: 100

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

Module-1

1 a. Why multiplexing technique is used in 8086? Mention its advantages. **(05 Marks)**
   b. Explain the internal architecture of Intel 8086 with neat block diagram and explain in brief. **(10 Marks)**
   c. Analyze the effective and physical address if :
   i.   Disp = 1B57H, DS = 2100H
   ii. DI = 1045H,   DS = 2100H
   iii. BP = 8000H,   DS = 5000H,   SS = 1000H,   Disp = 2345H
   iv. BX = 0158H,   SI = 1045H,   DS = 2100H,   SS = 1400H
   v.   BP = 0720H,   Disp = 1000H,   DS = 2000H,   SS = 4000H. **(05 Marks)**

OR

2 a. List the need of control word register of Intel 8086. Explain with an example. **(08 Marks)**
   b. What is addressing modes? Explain any four addressing modes with an example to each. **(08 Marks)**
   c. Interpret the following instructions : i) SUB and CMP ii) AND and TEST. **(04 Marks)**

Module-2

3 a. Identify the operation of the following instructions :
   i) NEG ii) CBW iii) DAA iv) AAD v) SAHF. **(05 Marks)**
   b. Write ALP to move 16 bytes of string of data from the offset 0200H to 0300H. **(10 Marks)**
   c. What are assembler directions? Explain the following assembler directions.
   i) Model ii) Assume iii) DB iv) DUP v) END. **(05 Marks)**

OR

4 a. Tell the functions of the following instructions with an example :
   i) ROL ii) RCR iii) SHL iv) SAR v) ROR. **(10 Marks)**
   b. Write ALP to convert 8 digits packed BCD number to 16 digits unpacked BCD number. **(10 Marks)**

Module-3

5 a. Explain the stack structure of 8086 and the operations of PUSH and POP instructions with examples. **(08 Marks)**
   b. Differentiate between procedure and macro. **(06 Marks)**
   c. Write an ALP to change a sequence of sixteen 2 byte numbers from ascending to descending order. Store the new series at different address. Use LIFO property of the stack. **(06 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 program to generate a delay of 100ms using an 8086 system that runs on 10 MHz frequency. Show the calculations. **(08 Marks)**

Module-4

7 a. Sketch the minimum mode configuration of 8086 and explain the operation briefly. **(08 Marks)**
   b. Interface two 4k×8 EPROM and two 4k×8 static RAM chips of 8086. The addresses of RAM and ROM should start from FC000H and FE000H respectively. **(08 Marks)**
   c. Draw the timing diagram for $\overline{RQ}/\overline{GT}$ for maximum mode. **(04 Marks)**

8 a. Write the control word format of 8255 PIA. **(06 Marks)**
   b. Show an interface of keyboard of 8086 and explain with a flowchart. **(10 Marks)**
   c. How is key Debounce achieved through hardware? **(04 Marks)**

Module-5

9 a. Explain the internal architecture of 8087. **(10 Marks)**
   b. Explain the following INT21 DOS function calls.
   i)   Function 01H
   ii) Function 02H
   iii) Function 09H
   iv) Function 07H
   v)   Function 0AH. **(10 Marks)**

OR

10 a. Write a program to generate triangular wave using DAC0800. **(10 Marks)**
    b. Write an ALP to rotate a stepper motor 100 steps clockwise direction for an 1.8° steps angle stepper motor connected to 8255 port. Show the calculation. Assume motor is rotating 12 rpm and processor speed 10MHz. **(10 Marks)**

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