Microprocessor
VTU CBCS Question Paper Set
2018

CBCS Scheme

USN | | | | | | | | | | | **15EC42**

Fourth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Microprocessor

Time: 3 hrs.   Max. Marks: 80

Note: *Answer FIVE full questions, choosing one full question from each module.*

Module-1

1 a. Define Microprocessor. Describe architecture of 8086, with neat block diagram. **(10 Marks)**
   b. Explain the significance of following pins of 8086 :
      i) ALE   ii) RESET   iii) $\overline{TEST}$ iv) M/$\overline{IO}$. **(04 Marks)**
   c. Explain the physical Address formation in 8086. **(02 Marks)**

OR

2 a. Explain the following addressing modes of 8086 :
      i) Register Addressing mode   ii) Based Indexed Addressing mode
      iii) Immediate Addressing mode   iv) Direct Addressing mode. **(08 Marks)**
   b. Explain the significance of following 1 bit indicators in opcodes of 8086 processor. **(04 Marks)**
   c. The Opcode for MOV instructions is "100010". Determine machine language code for the following instructions. i) MOV.AL.[BX]   ii) MOV 56[SI], CL. **(04 Marks)**

Module-2

3 a. Explain the following instruction with examples :
      i) LEA   ii) IDIV   iii) XLAT **(06 Marks)**
   b. Write a ALP to convert a 4 digit BCD No. into hexadecimal number. **(06 Marks)**
   c. Differentiate between the following instructions :
      i) AND & TEST   ii) SHIFT & ROTATE. **(04 Marks)**

OR

4 a. What are assembler directives? Explain the following assembles directives with examples :
      i) ASSUME   ii) DUP   iii) DB   iv) LABEL. **(08 Marks)**
   b. Write a ALP to find whether the given number is 2 out of 5 code. **(04 Marks)**
   c. Explain the string instructions of 8086. **(04 Marks)**

Module-3

5 a. Explain the stack structure of 8086 in detail. **(06 Marks)**
   b. Differentiate between procedure and Macro's. **(06 Marks)**
   c. Write a ALP to find factorial of Number. **(04 Marks)**

OR

6 a. Write a programme to generate a delay of 100 m sec using 8086 microprocessor operating on 10MHz frequency. Show calculation for the delay. **(06 Marks)**
   b. Explain the Interrupt Acknowledge sequence of 8086 with timing diagram. **(06 Marks)**
   c. Explain interrupt response structure of 8086. **(04 Marks)**

Module-4

7 a. Draw and discuss typical maximum mode of 8086. **(08 Marks)**
   b. Explain different modes of operation of 8255. **(08 Marks)**

OR

8 a. Interface two 4k × 8 EPROMS and two 4k × 8 RAM chips with 8086. (06 Marks)
   b. Interface eight seven segment display using 8255 with 8086. (06 Marks)
   c. Draw the timing diagram for $\overline{RQ}$ / $\overline{GT}$ for maximum mode. (04 Marks)

Module-5

9 a. Draw and discuss the interface between 8086 and 8087. (08 Marks)
   b. Explain the following keyboard handling INT21 DOS function :
      i) Function 01h   ii) Function 08h. (03 Marks)
   c. Write an ALP to interface stepper molar to 8086. (05 Marks)

OR

10 a. Differentiate between :
      i) Harvard and Von Neuman Architecture   ii) RISC and CISC Architecture. (06 Marks)
   b. Explain the significance of different bits of control word. Register format of 8253/54.
      (06 Marks)
   c. Write a program to generate triangular wave using DAC 0800. (04 Marks)

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CBCS Scheme

USN ☐☐☐☐☐☐☐☐☐☐   **15EC42**

Fourth Semester B.E. Degree Examination, June/July 2017
Microprocessor

Time: 3 hrs.   Max. Marks: 80

Note: *Answer FIVE full questions, choosing one full question from each module.*

Module-1

1   a.   Explain the internal architecture of 8086 with its neat block diagram.   **(08 Marks)**
   b.   Explain briefly any 4 addressing modes of data of 8086 with an example for each. **(06 Marks)**
   c.   If CS = 1000 H, DS = 25A0H, SS = 3210H, ES = 5890H, BX = 43A9H, BP = 3400H, find
    the physical address of the source data for the following instructions:
     (i)   MOV AL, [BX+1200H]
     (ii)   ADD BL, [BP+05]   **(02 Marks)**

OR

2   a.   Write down the instruction formats for the following two types of cases of 8086 and form
    the opcode for the indicated instruction:
     (i)   Register to Register; ADD AX, BX
     (ii)   Immediate to Register; ADD CX, 1200 H.   **(06 Marks)**
   b.   Write 8086 program to find the smallest number out of N 16 bit unsigned numbers stored in
    a memory block starting with the address 2000 H. Store the result at word location 3000 H.
                      (08 Marks)
   c.   Briefly explain the following 8086 instructions:
     (i)   XLAT   (ii)   NEG   **(02 Marks)**

Module-2

3   a.   Write a complete assembly language program in 8086 which replaces all the occurances of
    character '–' in a given string by '*'.   **(08 Marks)**
   b.   Verify whether any of the following instructions are wrong and correct them with reasons.
    Assuming following is a program, what is the value of register BX and flags CY, Z, P, S at
    the end.
     (i)   MOV BX, 0804H
     (ii)   INC [BX+02]
     (iii)   ADD 06H, AL
     (iv)   SHR DX, 02
     (v)   XOR BL, BL   **(08 Marks)**

OR

4   a.   Briefly explain the operations of the string instructions of 8086, indicating the initializations
    required to use them.   **(06 Marks)**
   b.   Write a complete assembly language program for block move of a source data (10 bytes)
    present in a memory block starting with address SOURCE to a destination block starting
    from address DSTN, using MOVS instruction. Consider overlapping of blocks also.
                      (08 Marks)
   c.   Explain briefly any 4 assembler directives.   **(02 Marks)**

Module-3

5 a. (i)   Explain the stack structure of 8086 and the operations of PUSH and POP instructions.

       (ii) Sketch the content of stack memory indicating the value of SP register before PUSH BX operation and after the PUSH BX operation. Assume SS = 2500 H, BX = 432AH and SP = 1000 H. **(08 Marks)**

  b. Write a procedure in 8086 assembly language which computes the factorial of an 8 bit number passed through AL register. The factorial value (maximum 8 bit) is returned through AL register. **(08 Marks)**

OR

6 a. What are the sequence of actions taken by 8086 and the device, when a device interrupts 8086 over INTR line? Explain about the software and reserved internal interrupts of 8086. **(08 Marks)**

  b. What are the differences between a procedure and a macro? Create a macro that would find the logical NAND value of two operands. **(04 Marks)**

  c. What are the methods that can be used to pass parameters to a procedure? Explain any one of them with an example. **(04 Marks)**

Module-4

7 a. Sketch the minimum mode configuration of 8086 and explain the operation briefly. **(08 Marks)**

  b. Interface two $4K \times 8$ EPROM and two $4K \times 8$ static RAM chips to 8086. The addresses of RAM and ROM should start from FC000H and FE000H respectively. **(08 Marks)**

OR

8 a. Sketch the maximum mode configuration of 8086 and explain the operation briefly. **(08 Marks)**

  b. Interface a 7-segment LED to 8086 using a 74LS373 latch for I/O address 0CH. Write a program that simulates a single digit seconds counter on the LED digit. (Assume a one second software delay is available) **(08 Marks)**

Module-5

9 a. Interface ADC 0808/0809 to 8086 using 8255 and write a program to convert the analog voltage connected to the last channel. Store the digital value in the location 2000H. **(08 Marks)**

  b. Interface a stepper motor to 8086 using 8255 and write a program to rotate the motor in clockwise direction 5 steps or in counter clockwise direction 10 steps, depending on whether the content of memory location 2000H is 00H or FFH respectively. **(08 Marks)**

OR

10 a. Explain the architecture of NDP-8087 with its internal block diagram. **(08 Marks)**

  b. Write a program in 8086 using DOS 21H interrupt which waits for a key to be pressed from the keyboard. If the key is 'G' display the message 'GOOD' on the CRT and display the message 'VERY GOOD', if the key V is pressed. Display 'NOT VALID' if any other key is pressed. **(05 Marks)**

  c. Explain mode-2 operation of 8254 timer briefly. What is the control word to be used to operate counter-1 in mode-2 binary? **(03 Marks)**

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