Hall Ticket No | | | | | | | | | | | Question Paper Code: AEC013

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech VI Semester End Examinations (Regular) - May, 2019

Regulation: IARE – R16

MICROPROCESSORS AND MICROCONTROLLERS

Time: 3 Hours **(ECE)** **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Explain the concept of segmentation in 8086 and hence explain how physical address is calculated. **[7M]**

   (b) Calculate the effective address & physical address of the following instructions.
   (i) IMUL AX, [BP + BX – 8D]
   (ii) SUB AL, ES:[SI + 5D]
   (iii) PUSH AX
   (iv) AND AH, [SI + 42D]
   (v) CMPSB
   (vi) CMPB DX, [SI].
   Assume C_S = 5000H, D_S = 8000H, S_S = A000H, E_S = B000H, S_I= 2000H, D_I = 6000H, B_P = 1002H, S_P = 0002H, A_X = 0000H, B_X = 5200H, C_X = 2000H. **[7M]**

2. (a) Draw the timing diagram for memory read and write machine cycles in 8086. **[7M]**

   (b) Describe the operation carried out when the following instructions are executed by 8086. **[7M]**
   i) MOV [SI],AX
   ii) MOV [BX],CX
   iii) XLAT
   iv) MUL,BL
   v) DIV,BL

UNIT – II

3. (a) Describe different external interrupts in 8086 and hence explain what happens when an interrupt occurs. **[7M]**

   (b) Write an assembly language program to find the largest number from an array of 5 numbers. **[7M]**

4. (a) Define stack? Draw the stack structure of 8086 with details of push and pop operations. **[7M]**

   (b) Write an assembly language program to display 'IARE MPMC LAB' on the screen. **[7M]**

UNIT – III

5. (a) What is function of a typical DMA Controller. Explain mode set register configuration in 8257. **[7M]**

   (b) Write an assembly language program to generate the saw tooth wave of voltage from 0V to 5V. (Assume oscillator frequency of 8MHz). **[7M]**

6. (a) Draw the 8251A internal architecture block diagram and elaborate mode instruction formats for synchronous and asynchronous communication. **[7M]**

   (b) Interface an ADC 0808 with 8086 using 8255 ports. Use port A of 8255 for transferring digital data output of ADC to the CPU and port C for control signals. Assume that an analog input is present of the ADC and a clock input of suitable frequency is available for ADC. Draw the interfacing diagram and write the necessary ALP to read the analog voltage and store in AL register. **[7M]**

UNIT – IV

7. (a) Write a program to get the x value from P_1 and send x_2 to P_2, continuously **[7M]**

   (b) Explain the following instructions in 8051 with examples.
   (i) MUL AB
   (ii)DIV AB
   (iv) SET B
   (vi) CPL A. **[7M]**

8. (a) Explain with a neat block diagram the architecture of 8051 micro controller. **[7M]**

   (b) Write 8051 program to convert packed BCD number available in accumulator, into two ASCII numbers and save them in internal RAM locations 48H and 49H. **[7M]**

UNIT – V

9. (a) Differentiate internal and external interrupts in 8051 with details of their interrupt vectors? **[7M]**

   (b) Explain the concept of serial communication in 8051 and hence describe how SCON register is configured. **[7M]**

10. (a) Write an 8051 program to find the sum of digits of an 8bit unsigned decimal number **[7M]**

    (b) Explain with a program to rotate the stepper motor in both clockwise and anticlockwise direction using 8051 microcontroller. **[7M]**

– ○ ○ ◯ ○ ○ –