Total No. of Questions : 10] [Total No. of Printed Pages : 4

Roll No. .....

EC–504(N)

B. E. (Fifth Semester) EXAMINATION, Dec., 2010

(New Scheme)

(Electronics & Communication Engg. Branch)

MICROPROCESSORS, MICROCONTROLLER AND EMBEDDED SYSTEMS

[EC – 504(N)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt any *one* question from each Unit. Total *five* questions are to be attempted. All questions carry equal marks.

Unit – I

1. (a) Explain the architecture of 16-bit processor 8086 with the help of block diagram indicating each component. How does it fetch an instruction from memory in MAX/MIN mode ? 10

   (b) Explain the following : 10

   (i) Segmental memory

   (ii) 8284 clock generator

Or

2. (a) Differentiate between maximum and minimum mode of 8086 μp with timing diagram. 10

   (b) Describe the Bus Buffering and latching. 10

P. T. O.

Unit – II

3. (a) Explain the following 8086 instructions : 10

(i) XLAT

(ii) SAHF

(iii) AAA

(iv) STD

(v) LES BX, [4000 H]

(vi) TEST AX, BX,

(vii) NOT [5000 H]

(viii) STOSW

(ix) MOV AX, [BX]

(x) OR BX, AX

(b) Explain the following : 10

(i) Macros

(ii) Interrupts

(iii) Procedures

(iv) Assembles procedure for 8086 μp with program.

Or

4. (a) WAP to transfer 50 bytes from data segment to extra segment. Explain co-processor with example. 10

(b) Explain Addressing modes of 8086. Identify the addressing modes used for the source and destination operands in the following instruction : 10

(i) MOV [SI], BX

(ii) MOV [SI], DI

(iii) MOV AL, BX

(iv) MOV [DI] + PQ, OX

(v) MOV [BX] [DX] + XY, C_U

(vi) MOV [BX] + PQR, DX

Unit – III

5. (a) What is the difference between 8253 and 8254 Programmable Interval Timer ? List the various modes of 8253. Explain any *one* mode with waveforms. 10

   (b) Write short note on any *one* of the following : 10

   (i) USART

   (ii) 8155 timer

Or

6. (a) Draw the functional block diagram of programmable interrupt controller 8259. 10

   (b) Describe the working of 8255 in BSR and I/O modes. Write a control word for configuring 8255 Port A as I/P Port, Port B as O/P Port and C_U and I/P Port and C_U as O/P Port. 10

Unit – IV

7. (a) What are the different addressing modes of 8051 ? Explain each with instruction. 10

   (b) Explain the Interfacing of 7 segment display with microcontroller using Assembly language program. 10

Or

8. (a) Describe the Architecture of 8051 microcontroller and explain special function registers SCON, SBUF and PCON of 8051. 10

   (b) Write Assembly language program to convert 8 bit binary no. in accumulator to 3 digits BCD. Store 100^{in} digits in R_2, 10^{s} digit in R_1 and units in R_0 of RB_1. What do you mean by the software simulation of 8051 ? What are the various development tools needed for testing and development of microcontroller boards ? 10

Unit – V

9. (a) Describe the architecture of embedded system and classification of embedded systems. 10

   (b) What are the main hardware units of an embedded system ? Describe each in brief and also describe an embedded system for smart card. 10

Or

10. (a) Write software tools and their function for designing an embedded system. Explain applications and products of embedded systems. 10

    (b) Write short notes on any *two* of the following : 10

    (i) Memory interfacing

    (ii) Watchdog timer

    (iii) Applications of real time operating system