Code: AE13

DECEMBER 2008

Subject: COMPUTER ENGINEERING

Time: 3 Hours

Max. Marks: 100

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q. 1. must be written in the space provided for it in the answer book supplied and nowhere else.**

- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**

- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1   **Choose the correct or best alternative in the following:**   **(2x10)**

a.   The memory unit for on 80486 micro processor requires _____ banks of memory.

   (A) One   **(B)** Two
   (C) Three   **(D)** Four

b.   To convert binary to octal & hexadecimal, combine _____ bits.

                                    (A) 3 & 4   **(B)** 3 & 3
   (C) 4 & 3   **(D)** None of above

c.   Architecture of 8086 introduced the concept of _____.

   (A) Pipeline   **(B)** Flag
   (C) Segmentation   **(D)** All of above

d.   Number of output ports in the peripheral mapped I/O is restricted to _____ ports.

   (A) 16   **(B)** 256
   (C) 65536   **(D)** 8

e.   Instruction that clears Accumulator is:

   (A) XRA A   **(B)** MVI A, 00
   (C) SUB A   **(D)** All of above

f.   Which of the following PROMs can be erased without requiring that the chip be removed from its socket?

   (A) UVEPROM   **(B)** EEPROM
   (C) UTPROM   **(D)** Maskable PROM

g.   The storage cell of a SRAM is actually a

   (A) Inductor   **(B)** Diode
   (C) Transistor   **(D)** Capacitor

h.   Serial transmission with SIM/RIM instruction work in _____ mode.

(A) Asynchronous   (B) Synchronous

(C) None of the above   (D) Both (A) and (B)

i.   Input port and Output port can have same port address.

(A) TRUE   (B) FALSE

j.   Highest priority interrupt in 8086 is

(A) Trap   (B) Divide by Zero

(C) NMI   (D) INT 21

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2   a.   Explain how each of the following Microprocessor features affects or not the processing rate of the chip. Also explain the way they affect. **(10)**
(i) Clock frequency   (ii) Data bus width
(iii) Address bus width   (iv) Internal cache memory
(v) Processor (internal or external)

     b.   Using 64K x 8 SRAMs, determine the minimum number of chips required to construct a memory interface for 8086 processor. Also design the complete interfacing. **(6)**

Q.3   a.   Explain all different types of memory with their classification. **(8)**

     b.   What is DMA data transfer scheme? Discuss the function DMA data controller 8257. **(8)**

Q.4   a.   Explain the complete architecture of 8086 along with memory segmentation concept. **(10)**

     b.   Perform the following operations: **(6)**
(i)   Addition with 8-bit two's complement 56 + 84
(ii)   Convert 100001 Binary code to Decimal
(iii)   Address lines = 14, then maximum _____ kB memory can be accessed
(iv)   (10000101)BCD = _____Hexa Decimal code.

Q.5   Do as directed:
(i)   Show the working of the instruction MOV[BP], AL where CS = 5D27, BP = 2C30 and AL = 05 **(2)**
(ii)   How many address lines are used to identity an I/O port in memory mapped I/O methods and peripheral I/O methods for 8085 architecture?

(2)
(iii)   CS = 0000H; DS = 2E98H; SS = A010H; ES = B000H. Draw 8086 memory map showing starting and ending of each memory segment.
(3)
(iv)   Explain the concept of: superscalar, Super - pipeline, L2 cache   **(6)**
(v)   Sketch the serial output waveform for character 'A' when it is transmitted with 9600 baud and even parity.   **(3)**

Q.6   a.   Write a note on different modes of 8254 timer. Also show what is the advantage of using 8254 timer for delay routine as compared to software delay routine?   **(10)**

b.   Write a service routine to read a data byte and then start conversation for the next reading.   **(6)**

Q.7   a.   Describe the features of ISA, EISA, AT, PCI, MCA and VESA bus structures.   **(12)**

b.   Determine the largest & smallest (most –ve) decimal number that can be represented using 16-bit signed binary numbers.   **(2)**

c.   Flat word = 0AC7H. Determine values of all the flags in 8086 microprocessor.   **(2)**

Q.8   a.   Write an assembly language using 8086 instruction set, to calculate number of 1's of each number in an array and sort the numbers according to number 1's in them. Use subroutines.   **(8)**

b.   Write an assembly language program using 8085 instruction set, for counting number of negative and positive numbers from an array starting at address XX50 having 10 lengths. Display '1' if negative numbers are greater than positive numbers else displays '0' at output port.   **(8)**

Q.9   a.   Compare the 80386, 80486 and Pentium processors.   **(8)**

b.   Give some example of 32-bit and 64-bit microprocessors which are manufactured by companies other than Intel.   **(8)**