COMP 5 – 3 (RC)

T.E. (Computer Engineering) (RC) (Semester – V) Examination, May/June 2012
MICROPROCESSOR AND MICROCONTROLLER

Duration : 3 Hours | Total Marks : 100

Instructions *: 1)* ***Assume*** *suitable data* ***if*** *necessary.*
2) Answer ***any five*** *questions, attempt at least one question from* ***each*** *Module.*
3) ***Draw*** *neat diagrams* ***if required****.*
4) Write question numbers legibly while answering.
5) Write description for the questions based on the ***marks*** *allotted.*

MODULE – I

1. a) The contents of 8086 registers are as given below. Find the physical addresses for the following instructions

D47OH in DS 2D91H in SS 1002 in ES
2111H in CS 0030H in BP 0040H in SP
0050H in SI 0060H in DI

Instructions :

MOV AL, [BP]
MOV CX, [SP]
MOV BL, [BP + SI]
MOV CS : [DI], AL. **6**

b) Consider the following data definition in data segment :

Varl DB 15 DUP (2, 3, 5 DUP (11, 12))

This statement will (pick one) :

A. Allocate 150 bytes in memory
B. Allocate 180 bytes in memory
C. Allocate 75 bytes in memory

Show the memory map for above data definition. **4**

c) With a neat diagram, explain the organization of the 8086 microprocessor. **10**

P.T.O.

2. a) With the help of an example describe the action performed by microprocessor 8086 for each of the following instructions. 6

   AAM

   CMPSB

   IMUL

   ROL

   b) Describe the response of 8086 to the following five primitive string operations.

   MOVS CMPS, SCAS, LODS and STOS. 6

   c) Write 8086 ALP to check whether the given unsigned integer number is palindrome or not. (i.e. Palindrome number reads the same from left to right or right to left, example 121) 8

MODULE – II

3. a) Explain the functionalities provided by the following interrupt service routines with examples.

   int 21h

   int 2h

   int 3h

   Also write a program segment to input and output strings. 12

   b) With block diagram explain the operation of I/O processor. 8

4. a) Explain the interface of 8086 and 8087 with clear functioning of RQ/GT pins. 8

   b) Convert decimal number 178.125 into the short real and long real representation used by the 8087. 4

   c) Write a program to compute the real roots of the quadratic equation $ax^2 + bx + c = 0$ using 8087 co-processor instructions. 8

MODULE – III

5. a) The 8255 PPI given in the figure 1 below is configured as follows : Port A – input port, port B as output port and all bits of the c port are output 8

   i) Find the port addresses assigned to A, B, C and control register.

   ii) Find the control byte for this configuration

iii) Program segment which inputs data from port A and send it to both ports B and C.

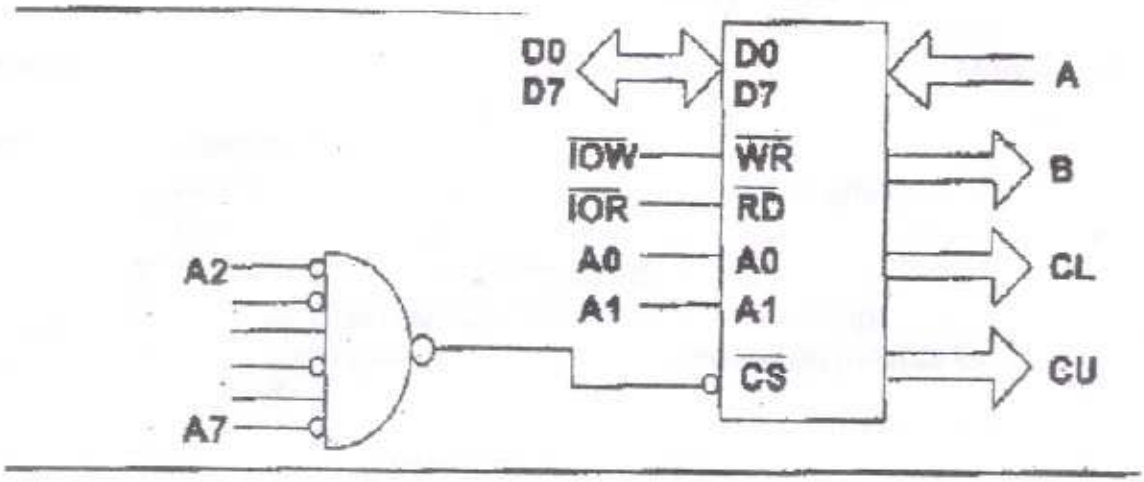

Figure 1 8255 configuration

b) Write 8086 program to generate i) 9600 pulses with a clock of 3.072 MHz and ii) 1 KHz square wave with a clock of 2 MHz using 8254. Make suitable assumptions. 6

c) How do you latch and read the count values in the middle of the count sequence in one of the counters of 8254 ? 6

6. a) Draw the circuit diagram for interfacing stepper motors to 8086 through 8255A. 6

b) Describe the circuit for interfacing an 8 bit ADC to 8086 through 8255A for simple I/O and interrupt I/O operations. 8

c) Draw the block diagram of 8251 and explain the salient features of this chip. 6

MODULE – IV

7 a) Draw the pin diagram of 8051. Explain the function of each pin in detail. 8

b) Explain the interrupt structure of 8051. 6

c) Explain the bit format of TMOD and TCON register in 8051. 6

8. a) Interface four 4K × 8 EPROMs and four 4K × 8 RAM chips with 8086. Draw suitable memory maps. 8

b) Describe how 80286 generate the physical address from logical address with a neat block diagram. 8

c) Explain the purpose and structure of IDTR in 80386 processor. 4