

5/12/14 Regular E



COMP 5 – 3 (RC)

T.E. Computer Engineering (RC) (Semester – V)
Examination, Nov./Dec. 2014
MICROPROCESSORS AND MICROCONTROLLERS

Duration : 3 Hours

Total Marks : 100

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

MODULE – I

1. a) Draw and explain the internal block diagram of 8086 microprocessor. 8
b) The contents of registers and memory location of 8086 system at a given time are given below : 8
(DS) = 6000H (DI) = 3000H (BX) = 2000H (AX) = 2000H
(SS) = 3000H (SI) = 5000H (CX) = 4000H (BP) = 4000H
(SP) = 7000H (CS) = 0000H (IP) = 4000H
Find the effective address for the following addressing modes.
i) Direct addressing mode
ii) Register addressing mode
iii) Based indexed addressing mode
iv) Relative based indexed addressing mode.
c) What is the difference between RET and IRET. Explain with an example. 4
2. a) Write an 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, e.g. 252). Add proper comments in the program. 10
b) Write the difference between the following instruction : 4
i) MOV CX, 437AH and MOV CX, [437 AH]
ii) MOV BL, 437AH and MOV BL, DS : BYTEPTR[437AH]

P.T.O.



- c) Draw the flag register indicating each bit in 8086. Explain briefly the flags. Also indicate which flags come under status and control flags. 6

MODULE – II

3. a) Discuss bit definitions of Tag word, control word and status word of 8087. 8
 b) Show how a coprocessor can be connected to an 8086 operating in maximum mode with all necessary interfacing signals. 6
 c) Write 8087 program to compute volume of a sphere $\left(V = \frac{4}{3} \pi R^3 \right)$ Add proper comments to explain the logic. 6
4. a) Draw and explain the internal architecture of 8087. 8
 b) Write 8087 program to find hypotenuse of a right angled triangle. Add proper comments to explain the logic. 8
 c) What is the significance of busy pin in 8087 ? 4

MODULE – III

5. a) Explain the internal architecture of 8255 PPI and its port selection logic. 6
 b) Explain with neat diagram control word register and status byte of 8254. 6
 c) Program 8254 to generate 8
 i) Interrupt signals at the rate of 4kHz from the clock of 1MHz
 ii) 10 kHz square wave from 100 kHz clock.
6. a) Explain operating modes of programmable timer (8253). 8
 b) Make control word when the ports of Intel 8255 are defined as follows : 4
 Port A as input port in mode 0
 Port B as output port in mode 0
 Port C upper (C_U) as an input port
 Port C lower (C_L) as an output port
 c) With the help of a neat diagram explain synchronous and asynchronous serial transmission with the help of USART. 8



MODULE – IV

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| 7. a) Draw and explain the block diagram of 8051 in detail. | 10 |
| b) List out SFRs supported by 8051 and its purpose. | 6 |
| c) Give the salient features of 80486. | 4 |
| 8. a) Draw the pin diagram of 8051. Explain the function of each pin in detail. | 6 |
| b) Explain the bit format of TMOD and TCON register in 8051. | 6 |
| c) Interface two 8K × 8 ROM and two 8K × 8 RAM chips with 8086. Select suitable maps. | 8 |