MANIPAL INSTITUTE OF TECHNOLOGY, MANIPAL 576104

(Constituent College of Manipal University)

FOURTH SEMESTER B.TECH. (IT) DEGREE MAKE UP EXAMINATION, JUNE – 2016
SUBJECT: COMPUTER ORGANIZATION AND MICROPROCESSOR SYSTMS – ICT 2202 / ICT 204
(REVISED CREDIT SYSTEM)

TIME: 3 HOURS   **30/ 06/2016**   **MAX. MARKS: 50**

Instructions to candidates
- Answer **ALL** questions.
- Missing data, if any, may be suitably assumed.

1A. Explain indirect addressing modes used in 8086 assembly language programming with suitable example.

1B. Justify the need for cache memory. Illustrate direct mapping and fully associative mapping techniques of cache memory management.

1C. Draw the functional pin diagram of 8086 microprocessor.   [5+3+2]

2A. Write 8086 assembly language program to sort an array of ten decimal numbers in ascending order using selection sort method.

2B. With a neat flow chart depict a 3 x 3 unsigned multiplier using *add and shift* method and perform multiplication of multiplicand $(4)_{10}$ with the multiplier $(5)_{10}$.

2C. Illustrate the carry save addition process of four 3 bit numbers using block diagram and hardware schematic.   [5+3+2]

3A. Discuss the format for 8254 software programmable timer/counter IC control word and exemplify the read back feature.

3B. Explain the programmed I/O and interrupt I/O methods of transferring data between the computer and a physical I/O device.

3C. Write a macro to accept a character string from a user using buffered input function of DOS interrupt.
[5+3+2]

4A. Explain the following instructions of 8086 microprocessor with one example for each.
   i.   PUSHF   iii. DAS   v.   LOOP
   ii. XLAT   iv.   RCR

4B. Write an assembly language program to generate a 40 kHz continuous pulses using counter 1 of 8254 software programmable timer/counter IC.

4C. Explain the following 8086 instructions with suitable example
   i.   SCASB   ii.   STOSB   [5+3+2]

5A. Draw the internal block diagram of 8255 PPI and summarize the different modes in which the ports of 8255 can be initialized.

5B. Perform the division of $(18)_{10}$ by $(3)_{10}$ using restoring method. Show all iterative steps involved.

5C. Write register transfer logic for 4 x 4 Booth's multiplier used in hardwired design approach of control unit.   [5+3+2]

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