Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

IV SEMESTER B.TECH. (INFORMATION TECHNOLOGY)

END SEMESTER EXAMINATIONS, APRIL/MAY 2017

COMPUTER ORGANISATION AND MICROPROCESSOR SYSTEMS

[ICT 2202]

REVISED CREDIT SYSTEM

(19/04/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data if any may be suitable assumed.

1A. What are the different types of addressing modes in 8086? Explain with an example for each. **5**

1B. Explain with a neat diagram how 8259 ICs can be cascaded to handle twelve external hardware interrupts. **3**

1C. Design a 4-bit combinational left shifter. **2**

2A. What is the need of cache mapping technique in computer system? The parameters of a computer memory system are specified as follows: **5**

Main memory size = 16K blocks
Cache memory size = 1024 blocks
Block size = 16 words
Determine the size of the tag field of the main memory address for the following mapping techniques:

i. Fully associative mapping
ii. Direct mapping
iii. Set associative mapping with 8 blocks/set.

2B. Explain the mechanism in 8086 for accessing **3**

i. a byte at an odd address ii. a word at an odd address.

2C. Differentiate macro and procedure. **2**

3A. With a neat diagram, explain the interfacing of DC motor to 8086 using 8254 IC. Also write an assembly language program for the same. **5**

3B. With neat diagrams, explain polled and daisy chain techniques for servicing multiple interrupts. **3**

3C. Explain the following instructions with an example for each: **2**

i. AAA ii. JCXZ

4A.	Design the processing section for 4x4 Booth's multiplier.	5
4B.	Write an assembly language program to accept a digit (in the range 0 to 8) from keyboard and display its factorial on the screen. Compute factorial using recursive procedure.	3
4C.	How is the 20-bit physical address generated for an instruction in 8086? Give an example.	2
5A.	Write the flow chart for restoring division algorithm. Perform division of $(1110)_2$ by $(110)_2$ using the same, indicating all the steps.	5
5B.	Write an assembly language program to insert a substring in a main string. Main string, substring and position of insertion is stored in the memory.	3
5C.	How is the main memory address generated from virtual address using paging system?	2