

Total No. of Questions—**12**

[Total No. of Printed Pages—**4+2**

Seat No.	
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[4457]-121

S.E. (Information Technology) (First Semester)

EXAMINATION, 2013

COMPUTER ORGANIZATION

(2008 PATTERN)

Time : Three Hours

Maximum Marks : 100

N.B. :— (i) Answer Q. No. **1 or 2, 3 or 4** and **5 or 6** from Section I and Q. No. **7 or 8, 9 or 10** and **11 or 12** from Section II.

(ii) Answers to the *two* sections should be written in separate answer-books.

(iii) Neat diagrams must be drawn wherever necessary.

(iv) Figures to the right indicate full marks.

(v) Assume suitable data, if necessary.

SECTION I

- 1.** (a) Draw IEEE standard single precision and double precision floating point formats. Represents $(1259.125)_{10}$ in single precision and double precision IEEE format. [8]

P.T.O.

- (b) Draw flowchart for restoring unsigned division algorithm and divide the following numbers using the same algorithm and justify your answer.

$$\text{Dividend} = (23)_{10}, \text{ Divisor} = (5)_{10} \quad [10]$$

Or

2. (a) Draw Von Neumann Architecture and explain function of registers in it. [8]
- (b) Draw flowchart of Booth's algorithm for signed multiplication. Multiply the following numbers using Booth's algorithm. Justify your answer :

$$(-12)_{10} \times (+14)_{10} \quad [10]$$

3. (a) Explain with examples the following addressing modes of 8086 :
- (i) Register Indirect
 - (iv) Base Index with displacement
 - (iii) Direct Addressing mode
 - (iv) Immediate addressing mode [8]
- (b) Draw block diagram showing basic minimum mode system of 8086. Explain functions of 8282 latches and 8286 transceivers. [8]

Or

4. (a) Specify factors which decide instruction length. Draw and explain instruction format for INTEL processors. [8]
- (b) Draw timing diagram for memory, write cycle of 8086 and list operations in each T state. [8]
5. (a) Write the control sequence for the execution of the following instruction for single bus organization :

SUB (R2), R1

where R2 is source register and R1 is destination register. [8]

- (b) Draw the diagram of microprogrammed control unit and give its advantages and disadvantages. [8]

Or

6. (a) Compare :
- (i) Hardwired and micro-programmed control
- (ii) Horizontal and vertical microinstruction format [8]
- (b) Explain the design of multiplier control unit using Delay Element Method. [8]

SECTION II

7. (a) What is MESI protocol ? Explain the meaning of each of the four states of the MESI protocol. [8]

- (b) A direct mapped cache has the following parameters :

Cache size = 2048 words, Block size = 128 words and main memory size is 64K words. Specify the number of bits in TAG, BLOCK and WORD fields. Discuss the mapping function and address structure of direct cache mapping technique. [10]

Or

8. (a) Write short notes on (any *two*) :

(i) RAID

(ii) DVD

(iii) SDRAM

(iv) EEPROM [8]

- (b) What is virtual memory ? Explain address translation mechanism for converting virtual address into physical address with neat diagram. [10]

9. (a) Compare :

(i) Memory Mapped I/O and I/O Mapped I/O

(ii) Programmed I/O and Interrupt driven I/O [8]

(b) List the features of IC8255 and IC8251. [8]

Or

10. (a) What is DMA ? Explain single transfer mode and block transfer mode of DMA data transfer. [8]

(b) Explain the working principle of the following : [8]

(i) Laser Printer

(ii) Keyboard

11. (a) Draw and explain loosely coupled multiprocessor configuration with its merits. [8]

(b) What is cluster ? State advantages of clustering. Explain cluster classification. [8]

Or

12. (a) Give the comparison between RISC and CISC processors. [8]

(b) Write short notes on (any *two*) : [8]

(i) Superscalar Architecture

(ii) UMA

(iii) NUMA

(iv) Symmetric multiprocessors.