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Total No. of Questions—12]

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[3962]-211

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

EXAMINATION, 2011

COMPUTER ORGANIZATION

(2008 PATTERN)

Time : Three Hours

Maximum Marks : 100

N.B. :— (i) Answer question 1 or 2, 3 or 4 and 5 or 6 from Section I and Question 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 flowchart of Booth's algorithm for signed multiplication. How does bit pair recoding technique achieve faster multiplication ?
Bit pair recode multipliers : [10]

$(110110101111001)_2$ and $(0101101010010101)_2$

- (b) Draw IEEE standard single precision and double precision floating point formats. Represent— $(99.75)_{10}$ in single precision and double precision IEEE format. [8]

P.T.O.

Or

2. (a) Draw flowchart of Booth's algorithm for non-restoring unsigned division and divide the following unsigned numbers and justify your answer. [10]

Dividend = $(15)_{10}$, Divisor = $(2)_{10}$

- (b) Draw detailed von Neumann architecture and explain function of registers in it. [8]
3. (a) Specify factors which decide instruction length. Draw and explain instruction format for INTEL processors. [8]
- (b) Draw and explain functional block diagram of 8086. [8]

Or

4. (a) State addressing modes for the following instructions and show physical address generation : [8]
- (i) MOV AX, [BX] [SI]
- (ii) MOV CX, [DI]
- (iii) MOV DX, [1234]
- (iv) MOV BX, [BP] [DI] [0045]
- (b) Draw timing diagram for memory cycle of 8086 and list operations in each T state. [8]
5. (a) Explain design of multiplier control unit using any hardwired design method. [8]
- (b) For a single bus organization of CPU, write micro-operations and control signals for unconditional branch instruction. [8]

Or

6. (a) Draw and explain general block diagram of the microprogrammed control unit. [8]
- (b) Compare : [8]
- (i) Hardwired and microprogrammed control
- (ii) Horizontal and vertical microinstruction format.

SECTION II

7. (a) Discuss set associative and fully associative cache mapping techniques with respect to mapping function, address structure, merits and demerits. [10]
- (b) Discuss page replacement strategies in detail. [8]

Or

8. (a) What is virtual memory ? Explain address translation mechanism for converting virtual address into physical address with neat diagram. [10]
- (b) Write short notes on (any two) : [8]
- (i) EEPROM
- (ii) SRAM
- (iii) Optical disk
- (iv) RAID
9. (a) What is DMA ? Explain DMA operation with a diagram. Also explain data transfer modes in DMA. [8]

(b) Compare : [8]

(i) Programmed I/O and Interrupt driven I/O.

(ii) Memory mapped I/O and I/O mapped I/O.

Or

10. (a) Explain working principle of the following : [8]

(i) Laser printer

(ii) Keyboard.

(b) Compare : [8]

(i) Parallel and serial communication

(ii) Synchronous and asynchronous serial communication.

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

(b) Explain briefly : [8]

(i) Instruction pipelining;

(ii) Superscalar architecture.

Or

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

(b) Compare : [8]

(i) UMA and NUMA

(ii) RISC and CISC.