UNIT - III

3 (a) Derive an algorithm in flowchart term for adding and subtracting two fixed-point binary numbers when negative numbers are in signed-is compliment representation. 8

(b) Design an array multiplier that multiplies two 4-bit number. Use AND gates and binary address. 8

OR

3 (a) Show that when we multiply two n-digit number in base r no overflow occurs.
The multiplication gives a product of 2^{nd} digits in length. 8

(b) Derive an algorithm in flow chart form for the non restoring method of fixed-point binary division. 8

UNIT - IV

4 (a) Construct a memory system having static 1K×4 RAM. How many such RAM's will be required to
(i) construct 1K×8 RAM bank ?
(ii) 4K × 4 RAM memory bank ? Show the block diagram and the address decoding circuit. 10

(b) Write short note on : Virtual memory. 6

OR

4 (a) An address space is specified by 24 bits and the corresponding memory space by 16 bits.
(i) How many words are there in the address space ?
(ii) How many words are there in the memory space ?
(iii) If a page consists of 2K words, how many pages and block are there in the system ? 10

(b) In a two level virtual memory, $t_{A1} = 10^{-7}$ S and $t_{A2} = 10^{-2}$ S. What must be the hit ratio H be in order for the access efficiency to be at least 90% of its maximum possible value ? 8