5 Semiconductor Memories

Multiple Choice Questions

Q.1 Which one of the following statements is correct?

(a) PROM contains a programmable 'AND' array and a fixed 'OR' array

(b) PLA contains a fixed 'AND' array and a programmable 'OR' array

(c) PROM contains a fixed 'AND' array and a programmable 'OR' array

(d) PLA contains a programmable 'AND' array and a programmable 'NOR' array

[ESE-2004]

Q.2 A ROM is to be used to implement a "squarer", which outputs the square of a 4-bit number. What must be the size of the ROM?

(a) 16 address lines and 16 data lines

(b) 4 address lines and 8 data lines

(c) 8 address lines and 8 data lines

(d) 4 address lines and 16 data lines

[ESE-2004]

Q.3 A single ROM is used to design a combinational circuit described by a truth table. What is the number of address lines in the ROM?

(a) Number of input variables in the truth table

(b) Number of output variables in the truth table

(c) Number of input plus output variables in the truth table

(d) Number of lines in the truth table

[ESE-2006]

Q.4 How may address inputs, data outputs are required for a 16k × 12 memory

(a) 12,12 (b) 16,12

(c) 14,12 (d) 16,16

Q.5 Consider the following statements for a DRAM:

1. Bit is stored as a charge.
2. It is made of MOS transistors.
3. Speed of DRAM is faster than processors.
4. Each memory cell requires six transistors.

Which of these statements are correct?

(a) 1 and 2 only (b) 2 and 3 only

(c) 3 and 4 only (d) 1, 2, 3 and 4

Numerical Data Type Questions

Q.6 A semiconductor RAM has a 12 bit address register and an 8 bit data register. The total number of bits in the memory is _____.

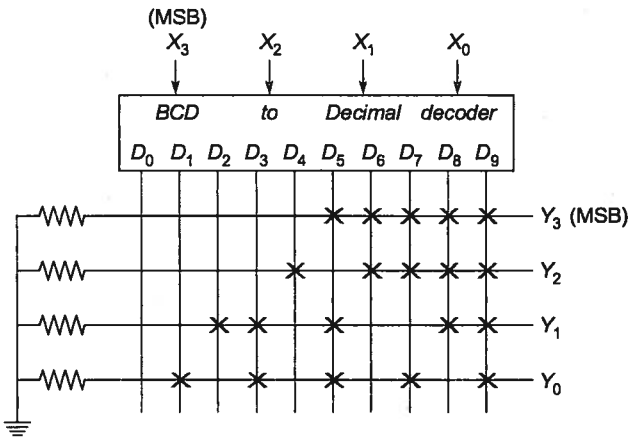
Q.7 It is desired to have 64 × 8 memory and if only 16 × 4 size chips are available then number of chips required are _____.

Q.8 The minimum number of MOS transistors required to make a dynamic RAM cell are _____.

Q.9 The minimum number of MOS transistors required to make a static RAM cell are _____.

Try Yourself

T1. Consider the ROM shown below.



If the coding scheme for $X_3\, X_2\, X_1\, X_0$ is BCD then find coding scheme for $Y_3\, Y_2\, Y_1\, Y_0$.

T2. Impliment the following logical expression using ROM circuit.

$Y_3\,(A, B, C) = \Sigma m(1, 2, 4, 7)$

$Y_2\,(A, B, C) = \Sigma m(1, 3, 5, 6)$

$Y_1\,(A, B, C) = \Sigma m(0, 2, 3, 4, 7)$

$Y_0\,(A, B, C) = \Sigma m(3, 5, 6, 7)$

T3. Implement BCD to excess - 3 convertor.