Digital Electronics

Tutorial Sheet 8

1.* What is meant by "efficient" implementation of logic?

2.** Implement the following logic using (a) gates and (b) ROM. Comment on the efficiency of both implementations.

$$f = \overline{A}BCD + A\overline{B}.\overline{C}D + ABCD + \overline{A}B\overline{C}D + \overline{A}.\overline{B}.\overline{C}D + \overline{A}.\overline{B}CD + A\overline{B}CD$$

For the case of ROM implementation, consider a 64 x 1 bit device and construct a memory map as follows:

	Col 0 Cells 0-7	Col 1 Cells 8-15	Col 2 Cells 16-23	Col 3 Cells 24-31	Col 4 Cells 32-39	Col 5 Cells 40-47	Col 6 Cells 48-55	Col 7 Cells 56-63
Row 0								
Row 1								
Row 2								
Row 3								
Row 4								
Row 5								
Row 6								
Row 7								

3.** Design a circuit free of static hazards to implement the function

$$f = \overline{B}.\overline{C}.\overline{D} + AB\overline{C} + BC\overline{D}$$