Fundamentals of Computer Engineering

HW# 6

Q.1. Show that the NAND and NOR operations are not associative.

Q.2. Given the function $F(w, x, y, z) = \Sigma(2,3,6, 10, 11)$ with a set of don't cares at $\Sigma(1,5, 9, 12, 13, 14, 15)$, obtain a simplified expression and two alternative 2-level implementations for the function in the following forms

  (i) SOP

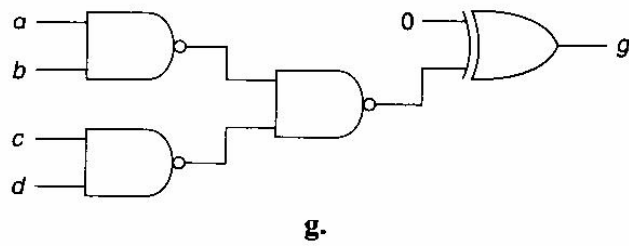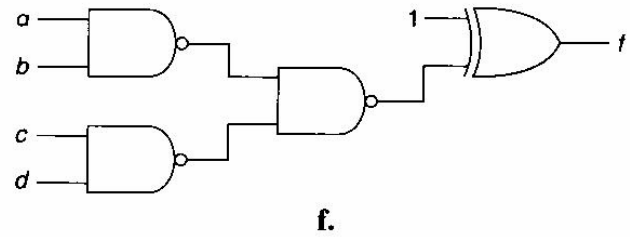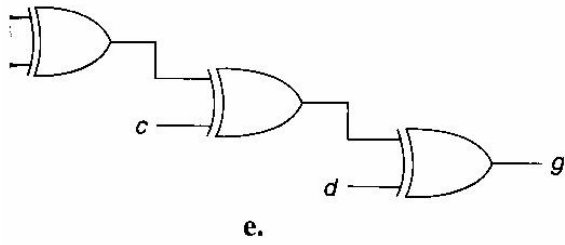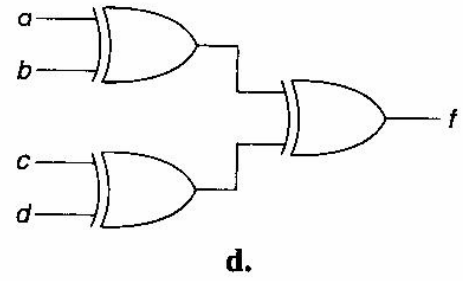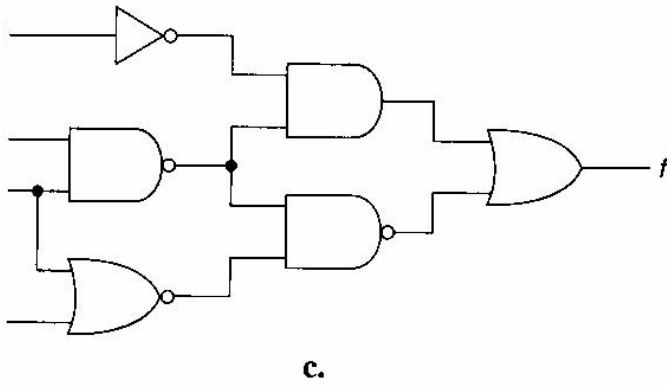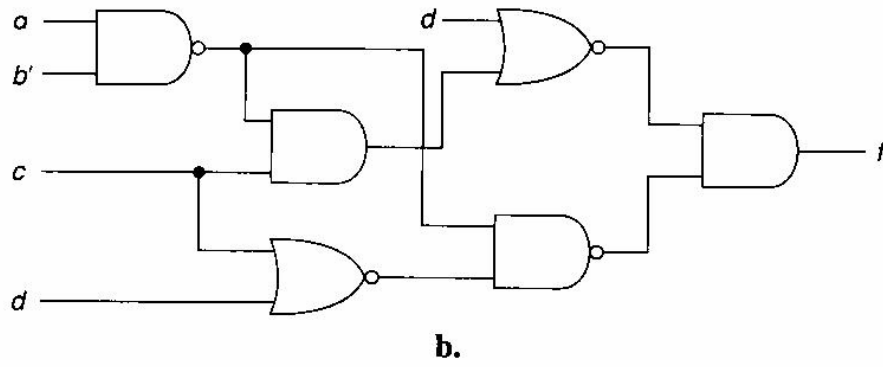 **(ii)** POS

  (iii) AOI

  (iv) OAI

Q.3. Algebraically, prove the following

  (i) $X \oplus 1 = X'$

  (ii) $X \oplus 0 = X$

  (iii) $(X + Y) \odot (X+Z) = X + (Y \odot Z)$

  (iv) $X \odot Y \odot (X+Y) = X\,Y$

Q 4 For each of the following circuits, find the expression of the output function then put it in a SOP form.

a.

b.

c.

d.

e.

f.

g.
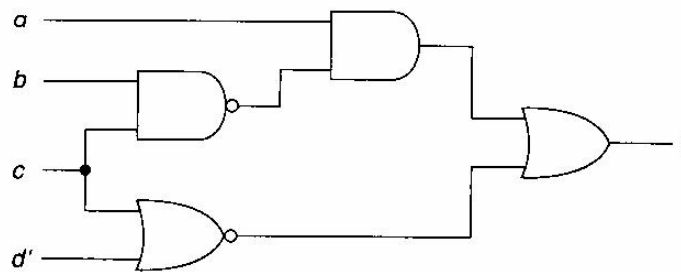
Q5) Convert the following to:
    (a) NAND-only implementation
    (b) NOR-only implementation