Question 3 (Constraint propagation):

Following is a constraint satisfaction problem:
Variables: w, x, y, z
Domains: each variable can take a value 0 or 1
Constraints: w = x, x = y, y=z, z≠w

(a) Explain what the reduced problem will be if you maintain arc consistency in this problem. [10%]
(b) Explain what the reduced problem will be if you maintain path consistency in this problem. There is no need to go through the detailed steps in the reduction. [13%]
(c) What is k-consistency? [5%]
(d) Suppose a constraint satisfaction problem has n+1 variables. Assume that after maintaining strong n-consistency in a constraint satisfaction problem, no domain has been wiped out. Does that guarantee that the problem has a solution? [7%]