CSE 494/CSE598/CBS598 Spring 2006: take home part of the final exam (Due: Beginning of the class April 20)

(1) For the polytree in Figure 19.4 (page 333) of the notes give the complete calculation for $P(Q|P_{12}, P_{10}, P_5)$ (20 points)
(2) Consider an extension of the 2-man firing squad example where following are the probability associated with the exogenous variables.

(a) There is a probability $P(U = 1) = p$ that the court has ordered the execution.
(b) There is a probability $P(W = 1) = r$ that the Rifleman B’s rifle is bad. (i.e, when he shoots from it, the bullet does not come out.)
(c) There is a probability $P(V = 1) = q$ that Rifleman A pulls the trigger out of nervousness.

(i) Modify the equation for $B$ so that $B$ depends on $C$ and $W$. (4 points)

Now determine the following:
(ii) $P$(prisoner dies) i.e., $P(D)$.
(iii) $P$(prisoner dies | $U = 1$)
(iv) $P$(prisoner dies | $A = 1$)
(v) $P$(prisoner dies | do ($A = 1$))
(vi) Find the probability of the following counter factual. “If the prisoner is dead, then even if $A$ were not to have shot, the prisoner would still be dead”. (3+3+3+3+6=18 points)

(You are required to show the details of your work. Just giving the final answer is not enough.)