Q1.

$$\Rightarrow f_1(A,C) = \sum_b P(A|B)P(B|C)$$

A	C	f(A,C)
T	T	0.34
F	T	0.66
T	F	0.4
F	F	0.6

$$\Rightarrow P(A,C) = f_1(A,C)P(C)$$
$$\Rightarrow P(A|C) = \frac{P(A,C)}{P(C)} = f_1(A,C)$$

A	C	Pr(A|C)
T	T	0.34
F	T	0.66
T	F	0.4
F	F	0.6

Q2.

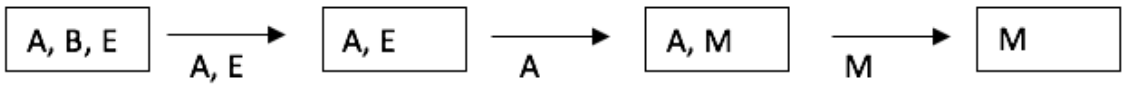
A: Alarm B: Burglary E: Earthquake M: MaryCalls J: JohnCalls

The good variable elimination order would be B, E, A or E, B, A.

The bad variable elimination order would be A, B, E or A, E, B.

From the cluster graph demonstrated below, in the good variable elimination order, the largest factor is in dimension 3 (TW = 2), but for the bad variable elimination order, the largest factor generated is in dimension 4 (TW = 3). Since the inference is $O(n2^{TW})$, the computation complexity for bad VE order would be larger than good VE order.

VE order: B, E, A



VE order: A, B, E