CS 6375 – Quiz 5 -Key

Name _____

1. Suppose a Bayesian network consists of n variables $\{x1, \cdots, xn\}$, is the following equation correct? ____

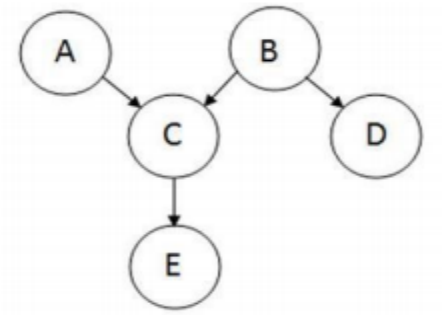
(Every two variables are conditionally independent given their parents, if not linked by an edge)

$$P(x_1, x_2, \ldots\ldots, x_n) = \prod_{i=1}^{n} P(x_i | parents(x_i))$$

where $parents(\mathrm{x}_i)$ means the parent nodes of x_i.

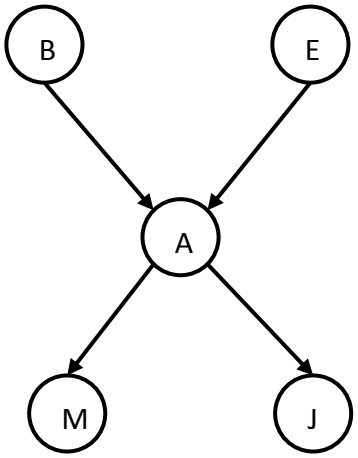
A. Yes
B. No

2. Which of the following is **false** about the Bayesian network? ____

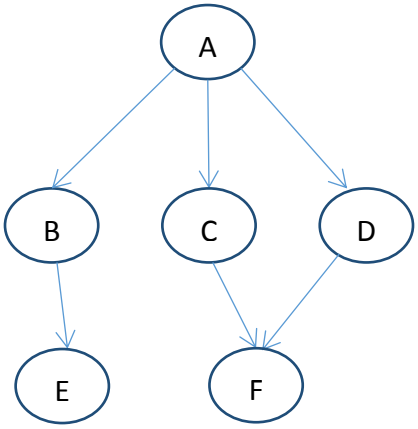


A. A and C are conditionally independent given B
B. A and B are conditionally independent given C
C. C and D are conditionally independent given B
D. E and B are conditionally independent given C

3. Draw the Bayesian network that represents P(J | A) P(M | A) P(A | B, E) P(B) P(E).



4. A full joint over 6 binary variables requires 2^6-1 = 63 parameters. How many parameters does this network require?



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5. Assume a HMM with two hidden states, Hot and Cold. What's the most probable weather sequence for observation sequence (1,2)?

Hot → Cold : 0.3, Hot → Hot : 0.7, Cold → Cold : 0.4, Cold → Hot : 0.6, Start → Cold : 0.3, Start → Hot : 0.7 P(1|Cold) = 0.8, P(2|Cold) = 0.2, P(1|Hot) = 0.1, P(2|Hot) = 0.9

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