Artificial Intelligence 2
Quiz #02 (Bayesian networks)

What is the relation between a Bayesian network and full joint probability distribution?

Define Bayesian network. What is a conditional probability table? Can there be undirected cycles in a Bayesian network?

What is difference between causal network and Bayesian network?

Does the arc in a Bayesian network always describe causal direction?

Why does the CPT for one Boolean parent and a Boolean variable contains just two numbers (see the burglary example and CPT for MaryCalls).

In the burglary detection example, calculate the probability of burglary for all four possible cases of phone calls from Mary and John.

What is a Markov blanket? How is it used (in which inference method)?

Is there a single Bayesian network representing the given full joint probability distribution?

Describe a method to construct a Bayesian network.

How can a "good" Bayesian network be recognized (and constructed)?

What is inference in a Bayesian network?

Describe the enumeration method of inference. What is its major disadvantage (inefficiency)?

What is the relation between inference by enumeration and variable elimination methods?

How does variable ordering influence the variable elimination method (from the soundness and efficiency views)?

How do we get the factors from the Bayesian network? Demonstrate the basic operations with factors.

Sketch the core idea of the Monte Carlo method. What is a sample?

What is a direct sampling method? Why cannot it be used directly to do any inference?

What is rejection sampling? What is its major disadvantage?

What is the weight in likelihood weighting? How is the weight used? What is the major disadvantage of likelihood weighting?

What is the major difference between the Markov Chain Monte Carlo method and rejection sampling and likelihood weighting?

Justify that MCMC works.