Sample Questions

1. Explain whether the following statements are True or False.

   (a) In an asynchronous system with processes prone to crash or Byzantine failures, deterministic algorithms cannot implement consensus.

   (b) The Two-Phase Commit Protocol is a non-blocking commitment protocol.

   Answer:

2. In the eventual leader detector abstraction (Ω), explain what happens if we don't partition the space of timestamps in each process? Think about the properties of this abstraction.
   Answer:

3. Consider Algorithm III (uniform consensus with eventually perfect failure detector). Assume that the process 0, which is the leader of the initial epoch, is correct. How can we simplify the algorithm so that it uses fewer communication rounds?
   Answer:

4. Describe a transformation that given uniform total-order broadcast abstraction implements a uniform consensus abstraction. Use the total-order broadcast abstraction with broadcast and deliver interface as a blackbox.
   Answer:

5. Use indistinguishability argument to prove that a non-blocking atomic commit abstraction is not possible with $\diamond$P.
   Answer: