CSE 160 Practice Questions

1. State 3 attributes that good interconnection networks have. How do they promote efficient communication?
2. What is the communication paradigm supported by PVM?
3. Draw examples of the following networks. Provide one fact about each.
   (a) shuffle-exchange
   (b) butterfly
   (c) square mesh (no wraparound)
   (d) hypercube
   (e) fat-tree
4. What is the diameter and bisection bandwidth of an n-dimensional hypercube with 2^n nodes? Draw one for n=3 in the space below.
5. What is "granularity" of a parallel computation? What is the goal of adjusting granularity of the computation to the granularity of the machine?
6. Describe the master/slave programming paradigm. Discuss the role of synchronization, predictability, and master/slave communication overhead with respect to the performance of programs based on this paradigm.
7. (a) Design a parallel algorithm using the message passing paradigm that would compute the maximum of a set of N numbers on an N processor parallel machine (you may choose the interconnection structure).
   (b) Design a parallel algorithm using the shared address space paradigm that would compute the maximum of a set of N numbers on an N processor PRAM.
8. (a) What is *circuit switching*?
   (b) What is *store-and-forward routing*?
   (c) Contrast the performance benefits of store-and-forward routing and circuit switching.