1. Please answer the following questions briefly?
   (a) What's IP-NG or IPv6 protocol? (5%)
   (b) What's Y-2K problem? Suggest one idea to solve it.(5%)
   (c) What's VRML? (5%)
   (d) What's Karnaugh Maps used in logic design? (5%)

2. Please define the following data structure and illustrate an example to show how to use it.
   (a) Heap (10%)
   (b) B-trees (10%)

3. Define the difference between preemptive and non-preemptive CPU scheduling. State why strict non-preemptive scheduling is unlikely to be used in a computer system. (10%)

4. Consider a system consists of 2 cooperating processes {P1,P2}. Each process has a segment of code, called a critical section, in which the process may be reading common variables, updating a table, writing a file, and so on. Consider the following algorithm and state your reasons to verify if this algorithm can satisfy mutual exclusion condition. (10%)

   var flag: array [0..1] of bollean;
   initialize flag array to be false. If flag[i] is true, then process Pi is executing in its critical section.
   The general structure of process Pi would be:
   repeat
       while flag [j] do skip;
       flag[i]:=true;

       ....
       critical section

       ....
       flag [i]:=false;
   remainder section
   until false;

5.
   (a) What's difference between Java and C language?(5%)
   (b) What's difference among LAN, Intranet and Internet? (5%)

6. Write a recursive procedure to find the greatest common divisor for two given positive integers (10%)

7. For a given concave polygon in 2D, suggest a divide-and-conquer method to decompose it to several convex polygons. Definition: for any two

interior points of a polygon, we can form a line segment. If this kind of line segment is always inside this polygon, we call this polygon as a convex polygon. (20%)

Convex
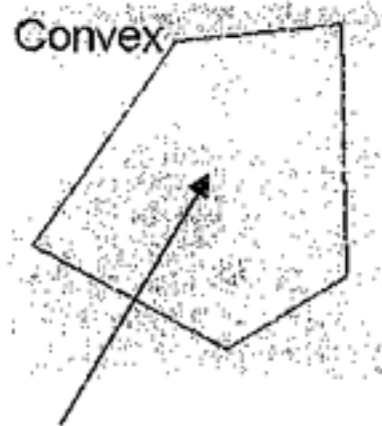
Line segments always inside polygon

Line segment outside polygon

Non-convex