

國立中央大學數學系
博士班資格考試〈圖論〉試題
2002年9月

Graph Theory
(20% each)

1. Describe Maximum flows problem and find an algorithm to find a maximum flow in the weighted network.
2. There are n workers and n jobs. The productivity of the i -th worker is $c(i,j)$ if he takes the job j .
 - (a) Try to find a optimal assignment of the n workers to n different jobs to achieve the maximum productivity.
 - (b) What is the dual problem of (a)?
3. Prove or disprove
 - (a) The even order complete graph is 1-factorable.
 - (b) The odd order complete graph can be 2-factored into Hamiltonian cycles.
4. Let S be the collection of all the n subsets of a given $2n+1$ set. The odd graph $O(n+1)$ is a graph with vertex set S such that any two vertices P, Q are adjacent if and only if P is disjoint from Q .
 - (a) Find the diameter of $O(n+1)$,
 - (b) Find the chromatic number of $O(n+1)$.
5. Try to construct a graph with chromatic number 10 but contains no triangle.