

GRAPH THEORY HW 2: DUE (IN CLASS) WEDNESDAY 4/4/2018

DAVID J. GRYNKIEWICZ

Question 1. *If G is a 3-regular graph containing a hamiltonian cycle, show that $\chi'(G) = 3$.*

Question 2. *Show that a d -regular graph has a proper d -edge coloring if and only if its edges can be partitioned into d edge-disjoint perfect matchings.*

Question 3. *For each $n \geq 1$, determine $\chi'(K_n)$.*

Question 4. *For a graph G , let $\alpha'(G)$ denote the maximum number of edges in a matching contained in G (so $\alpha'(G)$ is the maximal size of a collection of edges such that no two edges share a common vertex). If $m > \Delta(G)\alpha'(G)$, where m is the number of edges in G , show that $\chi'(G) = \Delta(G) + 1$.*

Question 5. *Let G be a graph on m edges and n vertices. If $m > \lfloor n/2 \rfloor \Delta(G)$, show that $\chi'(G) = \Delta(G) + 1$.*