GRAPH THEORY

Tutorial – 2

1) Let G be a connected simple graph not having P_4 or C_3 as an induced sub-graph. Prove that, G is a complete bipartite graph.

2) Suppose that, every vertex of a loop-less graph G has degree at least 3. Prove that, G has a cycle of even length.

3) Let G be an n-vertex digraph with no cycles. Prove that, the vertices of G can be ordered as $v_1, \ldots, v_n$ so that if $v_i v_j \in E(G)$, then $i < j$.

4) Let $d_1 \leq d_2 \leq \ldots \leq d_n$ be the vertex degrees of a simple graph G. Prove that, G is connected if $d_j \geq j$ when $j \leq n-1-d_n$.