Instructions: See previous homeworks for instructions.

To show that a problem is NP-Complete, show that it is in NP, and then show it is harder than one of: Independent Set, Vertex Cover, Clique, Rudrata Path (directed or undirected), Rudrata Cycle (directed or undirected). You do not have to prove that your reduction is correct, but you must provide the detailed reduction itself (i.e., the algorithm showing how to solve one problem using the other as a black box).

(1) DPV Problem 8.4. Note that for part (d), while you will receive partial credit for an algorithm with running time $O(|V|^4)$, to receive full credit you must give an algorithm with time $O(|V|)$.

(2) DPV Problem 8.9. Give a clear reduction (i.e., an algorithm solving one problem using the other as a black box) and show that the problem is NP-Complete; it is not enough to just say that $A$ is a generalization of $B$, you must provide a reduction.

(3) DPV Problem 8.13 (a,b,c). For NP-Complete problems, give a clear reduction (i.e., an algorithm solving one problem using the other as a black box) and show that the problem is NP-Complete; it is not enough to just say that $A$ is a generalization of $B$, you must provide a reduction. If showing that a problem is solvable in poly-time, give the poly-time algorithm.