CS2205: Theory of Computation
Problem Class XV

1. Consider the following problem:

   Problem XV.1. *BinPacking*

Parameters:	*A finite set S of positive integers, a positive integer k, and a positive integer b.*
Returns:	*YES if the members of S can be partitioned into k disjoint subsets such that the sum of the integers in each subset is b or less; NO otherwise.*

   Prove that *BinPacking* $\in$ **NP**.

2. Given a graph $G = \langle V, E \rangle$, an *independent set* is a subset S of G's vertices such that no two vertices in S have an edge between them in G.

   Now consider the following problem:

   Problem XV.2. *IndSet*

Parameters:	*A graph, $G = \langle V, E \rangle$, and a positive integer, k.*
Returns:	*YES if G contains an independent set of size $\geq k$; NO otherwise.*

   Prove that *IndSet* $\in$ **NP**.