1. Consider the following (directed) graph $G = (V, E)$ with capacities $c_e$ given on each edge. Let $s = 1$ and $t = 6$.

(a) Find a maximum $s$-$t$ flow in $G$. What is the value of this flow?
(b) Find a minimum (directed) $s$-$t$ cut in $G$. What is the value of this cut?

2. Decide whether the following statements are true or false.
   (You do not have to justify your answer.)
   (a) If $X \leq_P Y$ and $Y \in \text{P}$, then $X \in \text{P}$.
   (b) If $X \leq_P Y$ and $X$ is $\text{NP}$-complete, then $Y$ is $\text{NP}$-complete.