Solution.

(a) If $P = NP$, then it is implied that every problem in NP is as hard as every other problem in NP, including those that were considered NP-complete. $NP\text{-}C = NP = P$ since. So, clearly $P \cup NP\text{-}C = P \cup P = P = NP$, and since $NP \backslash NP = \varnothing$, we have completed the proof.

(b) If $NP \backslash (P \cup NP\text{-}C) = \varnothing$, then it must be the case that $NP \subseteq P \cup NP\text{-}C$. This implies that each element of NP either belongs to either P or $NP\text{-}C$. An $NP\text{-}I$ (intermediate) problem would be one from NP that belongs to neither P nor $NP\text{-}C$. The assumption $NP \subseteq P \cup NP\text{-}C$ implies that $NP\text{-}I = \varnothing$, and, by Ladner's theorem, it must follow that $P = NP$.