Quiz 3

Mark the correct answer by putting an **X** through the **correct** box. No justification needed

(1.1) If A and B are sets then $x \in A \oplus B$ iff x is in exactly one of A and B. $\boxed{\textbf{True}}$ $\quad$ $\boxed{\textbf{False}}$

(1.2) An infinite language contains at least one string of infinite length. $\boxed{\textbf{True}}$ $\quad$ $\boxed{\textbf{False}}$

(1.3) Let C be the relation on pairs of people defined by saying that $x\,C\,y$ iff x and y were born in the same country. Then C is an equivalence relation. $\boxed{\textbf{True}}$ $\quad$ $\boxed{\textbf{False}}$

(1.4) For $a, b \in \mathbb{R}$ define $a\,E\,b$ if $a - b \in \mathbb{Z}$. Then $[\pi]$, the equivalence class containing the real number $\pi = 3.14159\cdots$, is the real number $\pi - 3$. $\boxed{\textbf{True}}$ $\quad$ $\boxed{\textbf{False}}$

(1.5) $10n \log n \in O(n^2)$. $\boxed{\textbf{True}}$ $\quad$ $\boxed{\textbf{False}}$

(1.6) $10n \log n \in \Theta(n^2)$. $\boxed{\textbf{True}}$ $\quad$ $\boxed{\textbf{False}}$

(2) Formally define what it means for a function $f : A \to B$ to be one-to-one (injective).

(3) We proved in class that in any room of **six** people, some **three** people mutually know one another or some three people mutually do-not-know each other. (We assumed "knowing" to be symmetric.) Repeat our proof of this fact. You will be graded on writing a clear, correct, grammatical proof.