**CSE191, Fall 2013** **Quiz on Chapter 1** **Sep. 7, 2013**

This *closed-book/closed-notes* quiz counts as 40 points toward assignments, as provided on the printed course syllabus. Each question is multiple choice and has a unique best answer worth 4 points. (If you have doubt between two answers, partial credit may be given for a written justification of your choice.) Please **circle** your chosen answer.

YOUR NAME+ID HERE:

(1) A *proposition* can be:

(a) A statement like "this cat has nine lives."

(b) A variable like $P$ or $Q$.

(c) A compound statement like $P \vee (Q \longrightarrow P)$.

(d) A predicate $P(x)$ where $x$ is replaced by a particular value.

(e) All of the above.

(2) An implication $P \longrightarrow Q$ is guaranteed to be true when:

(a) $P$ is true.

(b) $Q$ is true.

(c) $Q \longrightarrow P$ is true.

(d) One of $P$ or $Q$ is false.

(3) A *formula* or *predicate* $F(x_1, \dots, x_n)$ with free variables $\vec{x} = x_1, \dots, x_n$ becomes a proposition (in lecture I preferred to say *sentence* or *propositional sentence*) when and only when:

(a) Every variable is filled in by an instance element.

(b) Every variable is quantified.

(c) Every variable is either filled in or quantified.

(d) It is always true, i.e., when $(\forall \vec{x})F(\vec{x})$ is true.

(4) If a Boolean formula $F$ is true when all of its variables are false, then:

(a) $F$ is a tautology.

(b) $F$ is satisfiable.

(c) $F$ is unsatisfiable.

(d) $F$ is a contradiction-in-terms.

(5) An example of a Boolean formula that is true when all of its variables are false is:

(a) $P \wedge Q$.

(b) $P \vee Q$.

(c) $P \longrightarrow Q$.

(d) $P$ **xor** $Q$.

(6) The Boolean formula $P \vee Q \longrightarrow R \wedge S$ is read as:

(a) $(P \vee (Q \longrightarrow R)) \wedge S$.

(b) $P \vee ((Q \longrightarrow R) \wedge S)$.

(c) $((P \vee Q) \longrightarrow R) \wedge S$.

(d) $(P \vee Q) \longrightarrow (R \wedge S)$.

(7) The statement "$P$ if $Q$" means:

(a) $P \longrightarrow Q$.

(b) $Q \longrightarrow P$.

(c) Both (a) and (b).

(d) Neither (a) nor (b).

(8) The formulas $P$ **xor** $Q$ and $\neg(P \leftrightarrow Q)$ are:

(a) Tautologies.

(b) Logically equivalent (in lecture I said "semantically equivalent").

(c) Both unsatisfiable.

(d) Inconsistent with each other.

(9) The logical argument "Given $P \longrightarrow Q$ and $Q$, we can conclude that $P$ is true" is:

(a) Valid.

(b) A fallacy.

(c) True by default.

(d) OK if you make it before breakfast.

(10) The person who is most honored for making logic into a branch of mathematics, even named in the basic `true/false` type of programming languages such as Java, C, and C++, lived:

(a) In ancient Greece.

(b) In the Middle Ages or Renaissance.

(c) In the 1800's.

(d) Until a few years ago.

End of Quiz