Your Name:

Duration of the Quiz is 25 minutes. There are five problems, worth 20 points. Show all your work for full credit. Books, notes etc. are prohibited. Calculators are NOT permitted.

1. (1 point each) Let p, q and r be the statements

   p: You have the flu.
   q: You miss the final examination.
   r: You pass the course.

   Write these propositions using p and q and logical connectives (including negations).

   - $p \rightarrow q$

   - $\neg q \leftrightarrow r$

   - $q \rightarrow \neg r$

   - $p \vee q \vee r$

   - $(p \rightarrow \neg r) \vee (q \rightarrow \neg r)$

   - $(p \wedge q) \vee (\neg q \wedge r)$

2. (1 point each) For each of these sentences, determine whether an inclusive or, or an exclusive or, is intended. Explain your answer.

   - Experience with C++ or Java is required.

   - Lunch includes soup or salad.

   - To enter the country you need a passport or a voter registration card.

   - Publish or perish.

3. (1 point each) Determine whether each of these conditional statements is true or false.

    (a) If $1 + 1 = 3$, then unicorns exist.

    (b) If $1 + 1 = 3$, then dogs can fly.

    (c) If $1 + 1 = 2$, then dogs can fly.

    (d) If $2 + 2 = 4$, then $1 + 2 = 3$.

4. (3 points) State the converse, contrapositive, and inverse of each of these conditional statements.

<div align="center">When I stay up late, it is necessary that I sleep until noon.</div>

5. (3 points) Construct a truth table for the following compound statement.

$$(p \wedge q) \vee \neg r$$