CISC 204  Class 10

Review of Material

Test #1 in this course will cover basic propositional logic. The material will be from Week 1 and Week 2 of the course. The main concepts are:

• Basic rules of inference: implication, disjunction, negation
• Proof by contradiction
• Basic semantics, truth tables

To study for this test, students should be able to do at minimum these exercises from the textbook:

§ 1.1: 1(a), 1(d), 1(j), 2(d)
§ 1.2: 1(a), 1(e), 1(m), 1(s), 2(b), 2(g), 2(h), 3(c), 3(g), 3(u), 7
§ 1.3: 1(d), 1(h), 4(b), 5

The next page of reference material will be reproduced on the test. Students are expected to understand the rules and how to apply them.
## Reference: Rules of Deduction in Propositional Logic

The basic rules in propositional logic:

<table>
<thead>
<tr>
<th>introduction</th>
<th>elimination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>∧</strong></td>
<td><strong>φ ψ</strong></td>
</tr>
<tr>
<td></td>
<td><strong>φ ∧ ψ</strong></td>
</tr>
<tr>
<td><strong>∨</strong></td>
<td><strong>φ ∨ ψ</strong></td>
</tr>
<tr>
<td></td>
<td><strong>ψ</strong></td>
</tr>
<tr>
<td><strong>→</strong></td>
<td><strong>φ → ψ</strong></td>
</tr>
<tr>
<td><strong>⊥</strong></td>
<td><strong>⊥</strong></td>
</tr>
<tr>
<td><strong>¬</strong></td>
<td><strong>¬φ</strong></td>
</tr>
</tbody>
</table>

Some derived rules in propositional logic:

- **φ → ψ, ¬ψ**
  - **¬φ** (MT)
- **φ**
  - **¬¬φ** (i)
- **φ**
  - **φ ∨ ¬φ** (PBC)
- **φ**
  - **φ ∨ ¬φ** (LEM)