1. (20 pts) What does the symbol \( \land \) stand for? Fill in the truth table for the \( \land \) operation.

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P )</td>
<td>( Q )</td>
</tr>
</tbody>
</table>

2. (15 pts) Let \( P, Q, \) and \( R \) be Boolean variables. If \( P = \text{True}, \ Q = \text{False}, \) and \( R = \text{False}, \) what are the values of the following expressions?

   (a) \( \neg P \)

   (b) \( \neg (Q \lor R) \)

   (c) \( \neg (P \land Q) \lor R \)

3. (15 pts) Define the following terms:

   (a) Contingency

   (b) Contradiction

   (c) Tautology

(Continued on the back)
4. (15 pts) In how many ways can truth values be assigned to $n$ Boolean variables?

5. (15 pts) How many different $n$-variable Boolean functions are there?

6. (20 pts) Construct a truth table for the Boolean expression (function)

\[ ((\neg p \rightarrow q) \land (\neg p \rightarrow \neg q)) \rightarrow p \]