About how many hours did you spend actively working on this assignment? ______

1a. Truth Table

1b. Karnaugh Map

1c. Minimal sum of products expression:

\[ F(A,B,C,D) = \]

2. Encoder

\[ \begin{array}{c}
\text{IN}_0 \\
\text{IN}_1 \\
\text{IN}_2 \\
\text{IN}_3 \\
\end{array} \quad \begin{array}{c}
\text{OUT}_1 \\
\text{OUT}_0 \\
\text{S} \\
\end{array} \]

(2’s place) (1’s place)

3. Switching Network (it fits here!)

A

B

C

D
4a. Cycles Completed  |  $Q_2$  |  $Q_1$  |  $Q_0$  
<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>0 (initial)</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>1</td>
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</tbody>
</table>

4b. **Explanation** (You do not need to fill this space.)

5. Draw circuits on next page, text answers here.

5b. Result =

5c. (Brief!)

5c(i) Sign bit of A-B gives **correct result** for A<B.
Example:

\[ A = \quad B = \]

5c(ii) Sign bit of A-B gives **incorrect result** for A<B.
Example:

\[ A = \quad B = \]

Reason:

Other parts of 5 will be drawn on the following page.
5a(i-iv) Condition Flags, 5c(iii) Less-Than Flag, 5d Equals Flag. Label outputs clearly.