1. (One point for each of the three answers.)

\[
\begin{align*}
E4_{16} &= \underline{\text{____________________2}} \\
       &= \underline{\text{____________________10 (interpreting binary as unsigned)}} \\
       &= \underline{\text{____________________10 (interpreting binary as two's complement)}}
\end{align*}
\]

2. (One point for each of the three answers.)

\[
\begin{align*}
8C_{16} &= \underline{\text{____________________2}} \\
       &= \underline{\text{____________________10 (interpreting binary as unsigned)}} \\
       &= \underline{\text{____________________10 (interpreting binary as two's complement)}}
\end{align*}
\]

Problems 3-5. (One point each.) Replace each JMP command with a BRA command that has the same effect.

3. Address Old contents New contents
\[
\begin{array}{ccc}
0002 & 7E & \underline{\text{______}} \\
0003 & 00 & \underline{\text{______}} \\
0004 & 01 & 01 \\
\end{array}
\]

4. Address Old contents New contents
\[
\begin{array}{ccc}
CC0A & 7E & \underline{\text{______}} \\
CC0B & CC & \underline{\text{______}} \\
CC0C & 0D & 01 \\
\end{array}
\]

5. Address Old contents New contents
\[
\begin{array}{ccc}
E2FF & 7E & \underline{\text{______}} \\
E300 & E2 & \underline{\text{______}} \\
E301 & EE & 01 \\
\end{array}
\]

Happy Thanksgiving!
Problems 6-8. (One point each.) Replace each BRA command (and the preceding NOP command) with a JMP command that has the same effect.

<table>
<thead>
<tr>
<th></th>
<th>Address</th>
<th>Old contents</th>
<th>New contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>3A9D</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3A9E</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3A9F</td>
<td>3A</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Address</th>
<th>Old contents</th>
<th>New contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>8AAE</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8AAF</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8AB0</td>
<td>AF</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Address</th>
<th>Old contents</th>
<th>New contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>EFFF</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F000</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F001</td>
<td>88</td>
<td></td>
</tr>
</tbody>
</table>

Problems 9-16 are based on the following program (all numbers are hexadecimal):

```
LDAA 0A
CMPA 0A
BEQ 03
INC 000A
JSR 000D
WAI
STAA FF
STAA FE
INC 00FE
RTS
WAI
```

Happy Thanksgiving!
9. (One point for each command.) If you wanted to load the program into memory, starting at address 0000, what would you load?

<table>
<thead>
<tr>
<th>Address</th>
<th>Contents</th>
<th>Address</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>__________</td>
<td>000B</td>
<td>__________</td>
</tr>
<tr>
<td>0001</td>
<td>__________</td>
<td>000C</td>
<td>__________</td>
</tr>
<tr>
<td>0002</td>
<td>__________</td>
<td>000D</td>
<td>__________</td>
</tr>
<tr>
<td>0003</td>
<td>__________</td>
<td>000E</td>
<td>__________</td>
</tr>
<tr>
<td>0004</td>
<td>__________</td>
<td>000F</td>
<td>__________</td>
</tr>
<tr>
<td>0005</td>
<td>__________</td>
<td>0010</td>
<td>__________</td>
</tr>
<tr>
<td>0006</td>
<td>__________</td>
<td>0011</td>
<td>__________</td>
</tr>
<tr>
<td>0007</td>
<td>__________</td>
<td>0012</td>
<td>__________</td>
</tr>
<tr>
<td>0008</td>
<td>__________</td>
<td>0013</td>
<td>__________</td>
</tr>
<tr>
<td>0009</td>
<td>__________</td>
<td>0014</td>
<td>__________</td>
</tr>
<tr>
<td>000A</td>
<td>__________</td>
<td>0015</td>
<td>__________</td>
</tr>
</tbody>
</table>

See reverse!!

Happy Thanksgiving!
After the program is executed…

10. What is the final value stored in Accumulator A?
11. What is the final value stored in the program counter?
12. What is the final value of the N bit in the condition codes register?
13. What is the final value of the Z bit in the condition codes register?
14. What is the final value of the C bit in the condition codes register?
15. What is the final value stored in address 00FF?
16. What is the final value stored in address 00FE?

Happy Thanksgiving!