1. Convert the following to their equivalent 8-bit hexadecimal values:

   \[ 10111010b \] \[ \text{__________} \]

   \[ 93 \] \[ \text{__________} \]

   -27 (2’s complement format) \[ \text{__________} \]

2. Give the range of numbers that can be represented in 10 bits using a 2’s complement number format.

3. Given a 40% duty cycle clock with a low clock width of 20 ns, what is the clock frequency in MHz?

4. Convert the following instructions into their machine language equivalent:

   MOV.B #0xE3,W4 \[ \text{__________} \]

   ADD 0x0804,WREG \[ \text{__________} \]

   MOV [W2],W6 \[ \text{__________} \]

5. Assume the contents of data memory and working registers are as given below.

<table>
<thead>
<tr>
<th>Location</th>
<th>Value</th>
<th>Location</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>W0</td>
<td>0x1000</td>
<td>0x800</td>
<td>0xAA</td>
</tr>
<tr>
<td>W1</td>
<td>0x2000</td>
<td>0x801</td>
<td>0xBB</td>
</tr>
<tr>
<td>W2</td>
<td>0x3000</td>
<td>0x802</td>
<td>0xCC</td>
</tr>
<tr>
<td>W3</td>
<td>0x0803</td>
<td>0x803</td>
<td>0xDD</td>
</tr>
</tbody>
</table>

   Give the value of the modified memory location or register for each of the following instructions:

   MOV.B [W3],W0 \[ \text{__________} \]

   MOV W1,0x800 \[ \text{__________} \]

   ADD 0x0802,WREG \[ \text{__________} \]

   SUB 0x0802,WREG \[ \text{__________} \]

6. Write PIC24 assembly language equivalents for the following C code fragments:

   ```
   while (u16_i != u16_k) {
       loop body statements
   }
   ```

   ```
   while ((u8_x != 0) && (u8_y < u8_z)) {
       loop body statements
   }
   ```