1. Do 16.14 (a); 16.18 (a)

2. Find (1) d.f. (degree of freedom) and (2) critical values using Table C.
   (a) \( n = 21, \alpha = .05, \) 2-tail test
   (b) \( n = 26, \alpha = .10, \) left side 1-tail test
   (c) \( n = 27, \alpha = .01, \) right side 1-tail test
   (d) \( n = 1200, \alpha = .05, \) 2-tail test
   (e) \( n = 800, \alpha = .02, \) left side 1-tail test
   (f) \( n = 927, \alpha = .01, \) right side 1-tail test

3. A random sample of 25 weights is taken from babies born at Lawrence Memorial Hospital. A mean of 7 lb and a standard deviation of 2.5 lb were found for the sample.
   (a) Estimate 90% confidence interval
   (b) Estimate 95% confidence interval
   (c) Estimate 99% confidence interval
   (d) Estimate 95% confidence interval when the sample was 16.
   (e) Test \( H_0 : \mu = 8 \) at \( \alpha = .05 \)
   (f) Test \( H_0 : \mu \geq 8 \) at \( \alpha = .10 \)

4. With the following information,

<table>
<thead>
<tr>
<th>Car</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand A</td>
<td>125</td>
<td>64</td>
<td>94</td>
<td>38</td>
<td>90</td>
<td>106</td>
</tr>
<tr>
<td>Brand B</td>
<td>133</td>
<td>65</td>
<td>103</td>
<td>37</td>
<td>102</td>
<td>115</td>
</tr>
</tbody>
</table>

   (a) Estimate 95% confidence interval of the paired difference, \( d \)
   (b) Test \( H_a : \mu_d \neq 0 \) (i.e., There is difference between brands) at \( \alpha = .01 \)
   (c) Test \( H_a : \mu_d < 0 \) (i.e., Brand A has less tire wear) at \( \alpha = .02 \)

5. (Extra Credit: 3 points–No extra points for late submissions)
   A sociologist is studying the effects of viewing a certain motion picture on the attitude of black men toward white men. 12 black men were randomly selected and asked to fill out a questionnaire before and after viewing the film. The higher score implies the more positive attitude. The scores received by the 12 men are listed in the table.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>10</td>
<td>13</td>
<td>18</td>
<td>12</td>
<td>9</td>
<td>8</td>
<td>14</td>
<td>12</td>
<td>17</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>After</td>
<td>5</td>
<td>9</td>
<td>13</td>
<td>17</td>
<td>4</td>
<td>5</td>
<td>11</td>
<td>14</td>
<td>13</td>
<td>18</td>
<td>7</td>
</tr>
</tbody>
</table>

   (a) Estimate 90% confidence interval of the paired difference, \( d \)
   (b) Test \( H_a : \mu_d \neq 0 \) (i.e., The attitude has not been changed) at \( \alpha = .05 \)
   (c) Test \( H_a : \mu_d > 0 \) (i.e., The negative attitude has been decreased by viewing the motion picture) at \( \alpha = .01 \)