1) The equivalent resistance between points a and b of the following resistor network is closest to

A. 2.7 Ω.
B. 14 Ω.
C. 30 Ω.
D. 7.7 Ω.
E. 10 Ω.

Answer: E

\[ \frac{1}{R_{eq}} = \frac{1}{12 \Omega} + \frac{1}{4 \Omega} = \frac{4}{12 \Omega} \]

\[ R_{eq} = 3 \Omega \]

\[ \frac{1}{R_{r2}} = \frac{1}{6 \Omega} + \frac{1}{3 \Omega} = \frac{3}{6 \Omega} \]

\[ R_{r2} = 2 \Omega \]

\[ R_{r1} = 3 \Omega + 5 \Omega + 2 \Omega = 10 \Omega \]

2) The magnitude of the readings on ammeters A1 and A2, respectively, are closest to

<table>
<thead>
<tr>
<th></th>
<th>reading on A1</th>
<th>reading on A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.030 A</td>
<td>0.006 A</td>
</tr>
<tr>
<td>B</td>
<td>0.030 A</td>
<td>0.038 A</td>
</tr>
<tr>
<td>C</td>
<td>0.030 A</td>
<td>0.024 A</td>
</tr>
<tr>
<td>D</td>
<td>0.19 A</td>
<td>0.015 A</td>
</tr>
<tr>
<td>E</td>
<td>0.19 A</td>
<td>0.038 A</td>
</tr>
</tbody>
</table>

Answer: E

\[ 3V - I_2 \times 80 \Omega = 0 \quad I_2 = 0.0375A \]

\[ 3V - I_3 \times 20 \Omega = 0 \quad I_3 = 0.15A \]

\[ I_1 = 0.035A + 0.15A = 0.185A \]