12. Solution: E

“Boxed” numbers in the table below were computed.

<table>
<thead>
<tr>
<th></th>
<th>High BP</th>
<th>Low BP</th>
<th>Norm BP</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular heartbeat</td>
<td>0.09</td>
<td>0.20</td>
<td>0.56</td>
<td>0.85</td>
</tr>
<tr>
<td>Irregular heartbeat</td>
<td>0.05</td>
<td>0.02</td>
<td>0.08</td>
<td>0.15</td>
</tr>
<tr>
<td>Total</td>
<td>0.14</td>
<td>0.22</td>
<td>0.64</td>
<td>1.00</td>
</tr>
</tbody>
</table>

From the table, we can see that 20% of patients have a regular heartbeat and low blood pressure.

13. Solution: C

The Venn diagram below summarizes the unconditional probabilities described in the problem.

In addition, we are told that

\[
x = \frac{1}{3}(x + 0.12) = \frac{1}{3}x + 0.04
\]

It follows that

\[
x = \frac{2}{3} = 0.04
\]

\[
x = 0.06
\]

Now we want to find

\[
P[(A \cup B \cup C)^c \mid A^c] = \frac{P[(A \cup B \cup C)^c]}{P[A^c]}
\]

\[
= \frac{1 - P[A \cup B \cup C]}{1 - P[A]}
\]

\[
= \frac{1 - 3(0.10) - 3(0.12) - 0.06}{1 - 0.10 - 2(0.12) - 0.06}
\]

\[
= \frac{0.28}{0.60} = 0.467
\]