1. Name the following C₅H₁₂ alkanes.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>pentane</td>
</tr>
<tr>
<td>B.</td>
<td>isopentane</td>
</tr>
<tr>
<td>C.</td>
<td>isopentane</td>
</tr>
<tr>
<td>D.</td>
<td>neopentane</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>pentane</td>
</tr>
<tr>
<td>2-methylbutane</td>
</tr>
<tr>
<td>2-methylbutane</td>
</tr>
<tr>
<td>2,2-dimethylpropane</td>
</tr>
</tbody>
</table>

2. Draw the structures of the following alkanes.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>2-methylhexane</td>
</tr>
<tr>
<td>B.</td>
<td>2,4-dimethyloctane</td>
</tr>
<tr>
<td>C.</td>
<td>3-ethyl-2-methylheptane</td>
</tr>
<tr>
<td>D.</td>
<td>3-ethyl-2,24-trimethylpentane</td>
</tr>
</tbody>
</table>

3. Draw all the structural isomers of C₈H₁₈. Which ones are chiral?

C₈H₁₈ conforms to CₙH₂ₙ₊₂ (n = 8). Hence, it is an alkane. Chiral C-atoms are marked with *.

<table>
<thead>
<tr>
<th>Base</th>
<th>Structure</th>
<th>Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-C</td>
<td></td>
<td>octane</td>
<td>achiral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2-methylheptane</td>
<td>achiral</td>
</tr>
<tr>
<td>7-C</td>
<td></td>
<td>3-methylheptane</td>
<td>chiral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4-methylheptane</td>
<td>achiral</td>
</tr>
<tr>
<td>Base</td>
<td>Structure</td>
<td>Name</td>
<td>Type</td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
<td>-----------------------</td>
<td>--------</td>
</tr>
<tr>
<td>6-C</td>
<td><img src="image1.png" alt="Image" /></td>
<td>2,3-dimethylhexane</td>
<td>chiral</td>
</tr>
<tr>
<td></td>
<td><img src="image2.png" alt="Image" /></td>
<td>2,4-dimethylhexane</td>
<td>chiral</td>
</tr>
<tr>
<td></td>
<td><img src="image3.png" alt="Image" /></td>
<td>2,5-dimethylhexane</td>
<td>achiral</td>
</tr>
<tr>
<td></td>
<td><img src="image4.png" alt="Image" /></td>
<td>2,2-dimethylhexane</td>
<td>achiral</td>
</tr>
<tr>
<td></td>
<td><img src="image5.png" alt="Image" /></td>
<td>3,3-dimethylhexane</td>
<td>achiral</td>
</tr>
<tr>
<td></td>
<td><img src="image6.png" alt="Image" /></td>
<td>3,4-dimethylhexane</td>
<td>chiral</td>
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<tr>
<td></td>
<td><img src="image7.png" alt="Image" /></td>
<td>3-ethylhexane</td>
<td>chiral</td>
</tr>
<tr>
<td>5-C</td>
<td><img src="image8.png" alt="Image" /></td>
<td>2,3,4-trimethylpentane</td>
<td>achiral</td>
</tr>
<tr>
<td></td>
<td><img src="image9.png" alt="Image" /></td>
<td>2,2,3-trimethylpentane</td>
<td>chiral</td>
</tr>
<tr>
<td></td>
<td><img src="image10.png" alt="Image" /></td>
<td>2,2,4-trimethylpentane</td>
<td>achiral</td>
</tr>
<tr>
<td></td>
<td><img src="image11.png" alt="Image" /></td>
<td>3-ethyl-2-methylheptane</td>
<td>achiral</td>
</tr>
<tr>
<td></td>
<td><img src="image12.png" alt="Image" /></td>
<td>2,3,3-trimethylpentane</td>
<td>achiral</td>
</tr>
<tr>
<td></td>
<td><img src="image13.png" alt="Image" /></td>
<td>3-ethyl-3-methylpentane</td>
<td>achiral</td>
</tr>
</tbody>
</table>
4. Draw all the structural isomers of $C_6H_{12}$. Which ones are chiral?

$C_6H_{12}$ conforms to $C_nH_{2n}$ ($n = 6$). Hence, it is an alkene or a cyclic alkane. Chiral C-atoms are marked with *.

<table>
<thead>
<tr>
<th>Base</th>
<th>Structure</th>
<th>Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-C</td>
<td><img src="4-C.png" alt="Image" /></td>
<td>2,2,3,3-tetramethylbutane</td>
<td>achiral</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Base</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-C</td>
<td><img src="6-C.png" alt="Image" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Base</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-C</td>
<td><img src="5-C.png" alt="Image" /></td>
</tr>
<tr>
<td>Base</td>
<td>Examples</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>3-methylenepentane</td>
<td></td>
</tr>
<tr>
<td>2,3-dimethylbut-2-ene</td>
<td></td>
</tr>
<tr>
<td>2,3-dimethylbut-1-ene</td>
<td></td>
</tr>
<tr>
<td>3,3-dimethylbut-1-ene</td>
<td></td>
</tr>
<tr>
<td>1,1-dimethylcyclobutane</td>
<td></td>
</tr>
<tr>
<td>1,2-dimethylcyclobutane</td>
<td></td>
</tr>
<tr>
<td>1,3-dimethylcyclobutane</td>
<td></td>
</tr>
<tr>
<td>ethylcyclobutane</td>
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</tr>
<tr>
<td>1,2,3-trimethylcyclopropane</td>
<td></td>
</tr>
<tr>
<td>1,1,2-trimethylcyclopropane</td>
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<tr>
<td>1-ethyl-1-methylocyclopropane</td>
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</tr>
<tr>
<td>1-ethyl-2-methylocyclopropane</td>
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</tr>
<tr>
<td>isopropylcyclopropane</td>
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</tr>
<tr>
<td>propylcyclopropane</td>
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</tbody>
</table>