The following space group symmetry diagrams are for primitive (P) orthorhombic space groups. For each write down the symmetry axis (either 2 or 2₁) that is parallel to each major axis, and give the symmetry plane (a, b, c, n, or m) that is normal (perpendicular) to each. Give the simplified Hermann-Mauguin symbol for the space group. In each figure, a is vertical, b horizontal, and c normal to page.

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The multiplicity of this space group is 8. If an atom is placed at fractional coordinates (x, y, z), equivalent positions are generated at (½-x, ½ -y, z); (½+x, ½+y, -z), (-x, -y, -z), (½-x, y, -z), (x, ½-y, -z), (½+x, -y, z), and (-x, ½+y, z). How many equivalents are generated for an atom placed at ¼, ¼, z? ________________

At (0, 0, 0)? ________________
2. An atom placed at \((x, y, z)\) has how many equivalents in this space group?

\[
\begin{array}{c|c}
\text{axis} & \text{plane} \\
\hline
a & \\
b & \\
c & \\
H-Msymbol & \\
Point Group & \\
\end{array}
\]

3. Can you give coordinates of equivalent positions in this space group?

\[
\begin{array}{c|c}
\text{axis} & \text{plane} \\
\hline
a & \\
b & \\
c & \\
H-Msymbol & \\
Point Group & \\
\end{array}
\]
4. What is the multiplicity of this space group? _______________  

axis | plane  
-----|--------  
\(a\) | ______ |  
\(b\) | ______ |  
\(c\) | ______ |  
H-Msymbol | ______ |  
Point Group | ______ |

What is the multiplicity of this space group? _______________

5. What is the multiplicity of this space group? _______________

axis | plane  
-----|--------  
\(a\) | ______ |  
\(b\) | ______ |  
\(c\) | ______ |  
H-Msymbol | ______ |  
Point Group | ______ |

What is the multiplicity of this space group? _______________

What special position would have multiplicity four? _______________
Can you give coordinates of equivalent positions in this space group?