Self Assessment

1. Process of producing cold or maintaining low temperatures is called as ________. 

2. Mathematical representation of 1st Law of thermodynamics is __________.

3. _______ is required to pump the heat from low temperature to high temperature.

4. _____ is the ratio of heat extracted ($Q_L$) to the work input ($W$) at a particular temperature.

5. Mathematical representation of COP is _______.

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6. COP at 100 K is 0.5. It means that _____W of input power is required to deliver _____ W of cooling power at 100 K.

7. A refrigerator operates in a _____ thermodynamic cycle.

8. A liquefier operates in a _____ thermodynamic cycle.

9. A Joule – Thompson expansion is an __________ expansion.
10. Fill the following table.

<table>
<thead>
<tr>
<th>$\mu_{JT}$</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;0</td>
<td>______</td>
</tr>
<tr>
<td>&lt;0</td>
<td>______</td>
</tr>
<tr>
<td>=0</td>
<td>______</td>
</tr>
</tbody>
</table>

11. ______ does not show any change in temperature when it undergoes J – T expansion.
Answers

1. Refrigeration

2. \( dQ = dU + dW \)

3. work

4. COP

5. \( COP = \frac{Q_L}{W} \)

6. 2 W, 1W

7. closed

8. open
9. Isenthalpic

10. $\mu_{JT}$

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</tr>
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<tbody>
<tr>
<td>&gt;0</td>
<td>Cooling</td>
</tr>
<tr>
<td>&lt;0</td>
<td>Heating</td>
</tr>
<tr>
<td>=0</td>
<td>No effect</td>
</tr>
</tbody>
</table>

11. Ideal gas