Q1. 800 mg of drug X was administrated to a patient through i.v. bolus. The drug plasma concentrations monitored after injection are listed in the table below.

<table>
<thead>
<tr>
<th>Time (min)</th>
<th>Conc. (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>72.9</td>
</tr>
<tr>
<td>7</td>
<td>57.9</td>
</tr>
<tr>
<td>15</td>
<td>40</td>
</tr>
<tr>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>60</td>
<td>5</td>
</tr>
</tbody>
</table>

a) Please state whether the drug follows a zero- or a first-order elimination process.

b) Estimate the elimination rate constant (ke) and half-life (T1/2).

c) Estimate the initial plasma drug concentration (C₀) and volume of distribution (Vd).

d) Estimate the initial plasma drug concentration (C₀) and AUC₀-inf.

e) Predict the drug plasma concentration 2 hrs after the injection (C₁₂₀).
Q2. Please fill in the missing numbers!

Total Body Water

Extracellular Fluid  Intracellular Fluid

Plasma Water  Interstitial Fluid

Q3. Mark each of the following statements True or False.

T  F  For a first-order elimination process, the same amount of drug is eliminated during a given time interval.

T  F  For a zero-order elimination process, the half-life (t1/2) depends on the drug concentration.

T  F  In a perfusion limited distribution, tissue membrane represents no barrier for the drug diffusion.

T  F  In a permeability limited distribution, blood flow is not important for rate of uptake.

T  F  Volume of distribution is the real tissue volume that contains the drug.

Q4. Define the term biopharmaceutics and pharmacokinetics.