Fluid, Electrolyte, and Acid-Base Balance: Water Homeostasis

1. Below are listed the four examples of disturbances in water homeostasis. Indicate if there is an increase (↑), decrease (↓), or no change (↔) in volume and osmolarity. Give an example of each.

<table>
<thead>
<tr>
<th>Disturbance</th>
<th>Volume</th>
<th>Osmolarity</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypervolemia</td>
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<tr>
<td>Hypovolemia</td>
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<td>Overhydration</td>
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<td>Dehydration</td>
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2. What are the four primary mechanisms to regulate fluid homeostasis?
   a. 
   b. 
   c. 
   d. 

3. Answer the following questions on antidiuretic hormone (ADH):
   a. What is the major stimulus? _______________________
   b. What is the direct effect of the hormone? _______________________
   c. What effect will this have on plasma volume and osmolarity? _______________________
   d. What effect will this have on urine volume and osmolarity? _______________________

4. List three ways dehydration leads to increased thirst:
   a. 
   b. 
   c. 

5. Answer the following questions on the Renin-Angiotensin-Aldosterone System.
   a. What enzyme is released from the kidney in response to decreased blood pressure? _______________________
b. What enzyme converts angiotensin I to angiotensin II? _____________

c. What are two effects of angiotensin II?

d. How does aldosterone cause more sodium to be reabsorbed in the kidney?

e. As a result, what happens to blood volume and blood pressure? ______

6. a. A decrease in blood volume and blood pressure will lead to a/an

______________ in the sympathetic nervous system (SNS).

b. This will result in a decrease (↓), and increase (↑), or no change (↔) in
the following:

1. _____ Afferent arteriolar constriction

2. _____ Blood flow to the glomerulus

3. _____ Urine loss

4. _____ Renin release

7. a. Diabetes insipidus is due to ______________________________.

b. What will happen to the following:

1. _____ Urine output

2. _____ Plasma sodium

3. _____ Plasma osmolarity

4. _____ Thirst