Section 1: Levels of Organization

Study Guide B

KEY CONCEPT
The human body has five levels of organization.

VOCABULARY

<table>
<thead>
<tr>
<th>determination</th>
<th>organ</th>
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</thead>
<tbody>
<tr>
<td>differentiation</td>
<td>organ system</td>
</tr>
<tr>
<td>tissue</td>
<td></td>
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</tbody>
</table>

MAIN IDEA: Specialized cells develop from a single zygote.

Fill in the main idea and supporting information for cell development.

1. Stem cells:

2. Determination:

3. Differentiation:

4. What are the characteristics of stem cells?

5. Look at Figure 1.2. Describe some of the shapes and structures that the cells in this figure acquired during differentiation.
6. Give two examples of how cell structures relate to cell functions.

_______________________________________________________________

_______________________________________________________________

_______________________________________________________________

**MAIN IDEA:** Specialized cells function together in tissues, organs, organ systems, and the whole organism.

7. Write a description of each level of organization and draw a sketch to help you remember it.

<table>
<thead>
<tr>
<th>Level of Organization</th>
<th>Description</th>
<th>Sketch</th>
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<tbody>
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</table>

**Vocabulary Check**

8. There is an easy way to remember the difference between *determination* and *differentiation*. Look at the first part of each word. Explain how these word parts can help you remember the meaning of each term.
KEY CONCEPT
Homeostasis is the regulation and maintenance of the internal environment.

VOCABULARY

<table>
<thead>
<tr>
<th>homeostasis</th>
<th>negative feedback</th>
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</thead>
<tbody>
<tr>
<td>feedback</td>
<td>positive feedback</td>
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</table>

MAIN IDEA: Conditions within the body must remain within a narrow range.

1. Give two reasons why it is so important that the internal environment of the body remains stable.

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

2. Homeostasis is maintained by control systems. Fill in the name and function of the parts of the control system in the cycle diagram below.

   - **Sensors**
   - **Control center**
   - **Targets**
   - **Communication system**

3. What might happen if a target organ cannot respond?

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
MAIN IDEA: Negative feedback loops are necessary for homeostasis.

4. Study the following line drawings. Which of the following diagrams represents negative feedback and which represents positive feedback? Explain your answer.

A.  

B.  

5. It’s a hot day and you’re sweating. Is this response an example of a positive or negative feedback loop? Explain your answer.

6. When you run, your muscles require more oxygen as their level of activity increases. Explain briefly how your control systems act to bring more oxygen into your body.

Vocabulary Check

7. What is the difference between positive and negative feedback loops?

8. Think of an analogy that would illustrate the process of feedback for someone who does not know what the word means.
Section 3: Interactions Among Systems

Study Guide B

KEY CONCEPT
Systems interact to maintain homeostasis.

VOCABULARY
thermoregulation

MAIN IDEA: Each organ affects other organ systems.
1. The organs in the body work together like members of a pit crew servicing a race car. What other analogies can you think of to illustrate organ systems working together?

2. Fill in the table below to explain what each organ does to help produce vitamin D in your body.

<table>
<thead>
<tr>
<th>Organ</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td></td>
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<tr>
<td>Liver</td>
<td></td>
</tr>
<tr>
<td>Kidneys</td>
<td></td>
</tr>
</tbody>
</table>

3. What role does the hypothalamus play to help regulate body temperature?

MAIN IDEA: A disruption of homeostasis can be harmful.
4. List three reasons why homeostasis in the body might be disrupted.
5. Why is a long-term disruption of homeostasis usually more serious than a short-term disruption?

_______________________________________________________________

Fill in the concept map to help you remember what you know about long-term and short-term disruption of homeostasis.

Disruption of homeostasis

6. 

7. 

8. 

9. 

10. damage to many organs over time

11. 

can be

usually leads to

can lead to

example

example

Vocabulary Check

11. Think of a diagram that might illustrate the term *thermoregulation* for someone unfamiliar with the word. Use the space below to sketch your diagram.