

## Quiz Yourself: Chapter 1

Choices can be used more than once or not at all

1-5. Matching

- |                       |  |             |
|-----------------------|--|-------------|
| A) Internal Condition | produces relevant responses                                      | 1) <u>E</u> |
| B) Receptor           | measures the internal condition                                  | 2) <u>B</u> |
| C) Set Point          | the optimal value for the internal condition                     | 3) <u>C</u> |
| D) Controller         | the variable to be maintained within an acceptable range         | 4) <u>A</u> |
| E) Effector           | determines the difference between the measured and optimal value | 5) <u>D</u> |

Fill in

- The effector causes responses that change the internal condition.
- In negative feedback, an *increase* in an internal condition will stimulate a response that decreases the internal condition in order to *normalize* it.
- In positive feedback, an *increase* in an internal condition will stimulate a response that increases the internal condition in order to *maximize* it.

Study Questions

- Explain the organization of homeostatic regulatory systems. Include the concepts of internal conditions, receptors, controllers, effectors, responses, negative feedback, and positive feedback.

## Quiz Yourself: Chapter 2

Choices can be used more than once or not at all

### 1-5. Matching

- |                        |  |                 |
|------------------------|--|-----------------|
| A) Intracellular fluid | Contain(s) electrolytes                  | 1) <u>  D  </u> |
| B) Interstitial fluid  | Composed mainly of water                 | 2) <u>  D  </u> |
| C) Vascular fluid      | Found in blood vessels (about 3L)        | 3) <u>  C  </u> |
| D) All of the above    | Found in interstitial fluid (about 11 L) | 4) <u>  B  </u> |
|                        | Found in cytoplasm of cells (about 28 L) | 5) <u>  A  </u> |

### 6-10. Matching (Typically)

- |                  |  |                  |
|------------------|--|------------------|
| A) Carbohydrates | Water soluble                                  | 6) <u>  D  </u>  |
| B) Proteins      | Eicosanoids are example                        | 7) <u>  C  </u>  |
| C) Lipids        | H, (NH <sub>2</sub> ), (COOH), and (R          | 8) <u>  B  </u>  |
| D) A&B           | Twice as many H as C; same number of O as C    | 9) <u>  A  </u>  |
| E) B&C           | Two or more times H than C; much less O than C | 10) <u>  C  </u> |

### 11-15. Matching

- |                    |                    |                  |
|--------------------|--------------------|------------------|
| A) Disaccharides   | starch or glycogen | 11) <u>  C  </u> |
| B) Monosaccharides | deoxyribose        | 12) <u>  B  </u> |
| C) Polysaccharides | glucose            | 13) <u>  B  </u> |
|                    | maltose            | 14) <u>  A  </u> |
|                    | ribose             | 15) <u>  B  </u> |

### 16-20. Matching

- |                  |   |                  |
|------------------|---|------------------|
| A) Glycerol      | a chain of three carbons each with hydrogens and hydroxyl | 16) <u>  A  </u> |
| B) Fatty acids   | carbons with hydrogen attached and a carboxyl group       | 17) <u>  B  </u> |
| C) Glycerides    | two fatty acids connected by a carbon ring                | 18) <u>  D  </u> |
| D) Eicosanoids   | glycerol with one, two or three fatty acids               | 19) <u>  C  </u> |
| E) Phospholipids | glyceride with phosphate attached                         | 20) <u>  E  </u> |

Fill in

21. Hydrogen bonds represent the attraction of a hydrogen atom with **O, N, or F**.
22. Water is an excellent solvent due to **hydrogen** bonding between water molecules.
23. Fats and steroids exhibit **no or limited** solubility in water.
24. The more unsaturated a fat, the more **double** **bonds** there are.
25. In fat synthesis **glycerol** and fatty acids combine to make glycerides plus **water**.

### Study Questions

1. Compare and contrast the major chemical bonds; and explain their significance.
2. Describe the location and composition of body fluids.
3. Describe the organization of electrolytes; and explain their behavior in water.
4. Compare and contrast molarity, osmolarity and pH, and explain how buffers moderate changes in pH.
5. Compare and contrast the composition of carbohydrates, lipids and proteins; and their behavior in water.
6. Compare and contrast the primary, secondary, and tertiary structure of proteins; and explain their significance.

## Quiz Yourself: Chapter 3

Choices can be used more than once or not at all

### 1-5. Matching

- |                        |                               |                 |
|------------------------|-------------------------------|-----------------|
| A) Anabolic reactions  | usually use energy            | 1) <u>  A  </u> |
| B) Catabolic reactions | assemble molecules            | 2) <u>  A  </u> |
|                        | breakdown molecules           | 3) <u>  B  </u> |
|                        | usually produce energy        | 4) <u>  B  </u> |
|                        | include dehydration synthesis | 5) <u>  A  </u> |

### 6-10. Matching

- |                        |                       |                  |
|------------------------|-----------------------|------------------|
| A) Anabolic reactions  | Oxidation             | 6) <u>  C  </u>  |
| B) Catabolic reactions | Hydrolysis            | 7) <u>  B  </u>  |
| C) A and B             | Phosphorylation       | 8) <u>  A  </u>  |
|                        | Dephosphorylation     | 9) <u>  B  </u>  |
|                        | Dehydration synthesis | 10) <u>  A  </u> |

### 11-15. Matching

- |                          |                                   |                  |
|--------------------------|-----------------------------------|------------------|
| A) Oxidation             | $AB + H_2O \rightarrow A-OH + BH$ | 11) <u>  B  </u> |
| B) Hydrolysis            | $A-OH + BH \rightarrow AB + H_2O$ | 12) <u>  E  </u> |
| C) Phosphorylation       | $A + P_i \rightarrow AP_i$        | 13) <u>  C  </u> |
| D) Dephosphorylation     | $AP_i \rightarrow A + P_i$        | 14) <u>  D  </u> |
| E) Dehydration synthesis | $A + O \rightarrow AO$            | 15) <u>  A  </u> |

### 16-20. Matching

- |                                 |  |                  |
|---------------------------------|--|------------------|
| A) Allosteric control of enzyme | Controlled by phosphorylation                                | 16) <u>  B  </u> |
| B) Covalent control of enzyme   | Can cause inhibition of enzyme                               | 17) <u>  D  </u> |
| C) No control of enzyme         | Can cause activation of enzyme                               | 18) <u>  D  </u> |
| D) A or B                       | Controlled by end product of reaction                        | 19) <u>  A  </u> |
|                                 | Not affected by phosphorylation or end product concentration | 20) <u>  C  </u> |

Fill in

21. Enzymes act as **catalysts**.
22. Enzymes can be made either of proteins or **RNA**.
23. **Hydrolysis** is a common reaction in the breakdown of fats to fatty acids and glycerol.
24. **Dehydration synthesis** is a common reaction in the synthesis of peptides from amino acids.
25. **Cofactors** help an enzyme hold its normal conformation.

### Study Questions

1. Explain the role of chemical reactions and enzymes in the functioning of cells.
2. Compare and contrast dehydration synthesis and hydrolysis. Include a description of the role of enzymes.
3. Explain the significance of phosphorylation and the role of ATP and GTP in phosphorylation.
4. Compare and contrast allosteric and covalent regulation, and explain the role of enzymes.
5. Describe the composition of nucleotides; and compare and contrast nucleotides with ATP and GTP.

## Quiz Yourself: Chapter 4

Choices can be used more than once or not at all

1-5. Matching

- A) Purine
- B) Pyrimidine
- C) none of the above

- Uracil 1)   B
- Cytosine 2)   B
- Thymine 3)   B
- Adenine 4)   A
- Guanine 5)   A

6-10. Matching

- A) adenine
- B) guanine
- C) thymine
- D) cytosine

- pairs with adenine 6)   C
- pairs with guanine 7)   D
- pairs with thymine 8)   A
- pairs with cytosine 9)   B
- pairs with uracil 10)   A

11-15. Place the following steps of Transcription in order.

- A) introns are removed first 11)   C
- B) messenger RNA moves to cytoplasm of cell second 12)   D
- C) RNA polymerase binds at the promoter sequence of the DNA third 13)   A
- D) precursor RNA formed from DNA - includes introns and exons fourth 14)   E
- E) messenger RNA formed by splicing together exons of the precursor RNA fifth 15)   B

16-20. Place the following steps of Translation in order.

- A) tRNA with an appropriate anticodon carries in a specific amino acid first 16)   E
- B) adjacent amino acids are linked by peptide bonds second 17)   D
- C) a termination sequence is reached third 18)   A
- D) mRNA attaches to ribosomes fourth 19)   B
- E) mRNA leaves the nucleus fifth 20)   C

Fill in

- 21. Ribose or deoxyribose, a nitrogenous base and phosphate make a   nucleotide  .
- 22. RNA nucleotides contain   more   oxygen than DNA nucleotides.
- 23. The strands of the DNA double helix are held together by hydrogen bonds between   purines   and   pyrimidines  .
- 24. The   tDNA   (template DNA) nucleotide sequence Cytosine, Adenine, Thymine will lead to the messenger RNA nucleotide sequence   Guanine     Uracil     Adenine  .
- 25. In order to act, RNA polymerase must attach to the   promoter   region of the gene.

Study Questions

1. Compare and contrast the composition and organization of DNA and RNA.
2. Explain what is meant by "gene expression" and explain how transcription factors (chemical messengers) control gene expression.
3. Describe the major steps in transcribing DNA into mRNA, in translating mRNA into protein and in determining the destination of the protein.