**Chapter 5 Pre-Test (A)**

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

**\_\_\_\_ 1.** Which of the following descriptions is correct about the chemical reactions that occur in the cell?

|  |  |
| --- | --- |
| **a.** | anabolism + catabolism = metabolism |
| **b.** | anabolism + metabolism = catabolism |
| **c.** | catabolism + metabolism = anabolism |
| **d.** | anabolism + catabolism = activation energy |

**\_\_\_\_ 2.** The products of a chemical reaction refer to the substances that

|  |  |
| --- | --- |
| **a.** | initiate the reaction. |
| **b.** | undergo dehydration synthesis. |
| **c.** | are needed to start the reaction. |
| **d.** | form as a result of the reaction. |



**\_\_\_\_ 3. Use the diagram above to answer the next question.**

What process produces this molecule?

|  |  |
| --- | --- |
| **a.** | replication |
| **b.** | photosynthesis |
| **c.** | protein synthesis |
| **d.** | cellular respiration |

**\_\_\_\_ 4.** Which of the following molecules is the energy currency of the cell?

|  |  |
| --- | --- |
| **a.** | ATP |
| **b.** | DNA |
| **c.** | mRNA |
| **d.** | carbohydrates |

**\_\_\_\_ 5.** Where is the organ that produces thyroxine located in the body?

|  |  |
| --- | --- |
| **a.** | in the neck |
| **b.** | in the head |
| **c.** | in the arms |
| **d.** | in the chest |

**\_\_\_\_ 6.** By what method does the thyroid gland take up iodine ions?

|  |  |
| --- | --- |
| **a.** | osmosis |
| **b.** | diffusion |
| **c.** | active transport |
| **d.** | facilitated transport |



**\_\_\_\_ 7. Use the diagram above to answer the next question.**

Which of the following cell structures is the location of thyroxine production?

|  |  |
| --- | --- |
| **a.** | 1 |
| **b.** | 2 |
| **c.** | 11 |
| **d.** | 12 |



**\_\_\_\_ 8. Use the diagram above to answer the next question.**

Which of the following are functions of the hormones produced in structure Y?

|  |  |
| --- | --- |
| I | increase metabolic rate |
| II | increase protein synthesis |
| III | increase the amount of ATP used by cells |

|  |  |
| --- | --- |
| **a.** | I and II only |
| **b.** | I and III only |
| **c.** | II and III only |
| **d.** | I, II, and III |

**\_\_\_\_ 9. Use the diagram above to answer the next question.**

Which of the following statements describes a function of the hormone produced by four small glands embedded behind structure Y?

|  |  |
| --- | --- |
| **a.** | causes the blood iodine levels to decrease and blood calcium levels to increase |
| **b.** | causes the blood iodine levels to decrease and blood phosphate levels to increase |
| **c.** | causes the blood phosphate levels to decrease and blood calcium levels to increase |
| **d.** | causes the blood phosphate levels to increase and blood calcium levels to decrease |



**\_\_\_\_ 10. Use the diagram above to answer the next question.**

Which of the following statements describes the diagram above?

|  |  |
| --- | --- |
| **a.** | B is the reactant for E1. |
| **b.** | E3 is the substrate for Enzyme D. |
| **c.** | C is the reactant for Enzyme 2 and the product of Enzyme 3. |
| **d.** | F is the product of Enzyme 5 and the substrate for Enzyme 6. |

**\_\_\_\_ 11.** Which of the following are unit molecules for enzymes?

|  |  |
| --- | --- |
| **a.** | lipids |
| **b.** | glucose |
| **c.** | amino acids |
| **d.** | phospholipids |



**\_\_\_\_ 12. Use the diagram above to answer the next question.**

If B is ribonuclease, then what does E represent?

|  |  |
| --- | --- |
| **a.** | a lipid |
| **b.** | glucose |
| **c.** | a nucleotide |
| **d.** | an amino acid |

**\_\_\_\_ 13. Use the diagram above to answer the next question.**

If B is amylase, then what does E represent?

|  |  |
| --- | --- |
| **a.** | maltose |
| **b.** | fructose |
| **c.** | cellulose |
| **d.** | glycogen |



**\_\_\_\_ 14. Use the diagram above to answer the next question.**

What type of reaction is shown above?

|  |  |
| --- | --- |
| **a.** | synthesis |
| **b.** | hydrolysis |
| **c.** | anabolism |
| **d.** | lipid synthesis |



**\_\_\_\_ 15. Use the graph above to answer the next question.**

What does “Y” represent in the graph?

|  |  |
| --- | --- |
| **a.** | the amount of ADP produced |
| **b.** | the amount of ATP produced |
| **c.** | the amount of energy of activation required in the absence of an enzyme |
| **d.** | the amount of energy of activation required in the presence of an enzyme |

**\_\_\_\_ 16.** Which of the following statements explains why the active site changes its shape once the enzyme binds to a substrate?

|  |  |
| --- | --- |
| **a.** | to protect the substrate |
| **b.** | to obtain energy from the substrate |
| **c.** | to hold the substrate in so that it does not fall out |
| **d.** | to achieve a better fit so that the reaction can proceed |

**\_\_\_\_ 17.** Which of the following factors can affect the reaction rate of enzymes?

|  |  |
| --- | --- |
| I | cofactors |
| II | enzyme inhibition |
| III | substrate concentration |

|  |  |
| --- | --- |
| **a.** | I and II only |
| **b.** | I and III only |
| **c.** | II and III only |
| **d.** | I, II, and III |

**\_\_\_\_ 18.** Which of the following occurs due to denaturation?

|  |  |
| --- | --- |
| **a.** | The R-group in the enzyme changes. |
| **b.** | The secondary structure of the enzyme changes. |
| **c.** | The amino acid sequence of the enzyme changes. |
| **d.** | The peptide bonding between the amino acids break apart. |



**\_\_\_\_ 19. Use the graph above to answer the next question.**

At what pH does amylase bind to its substrate the best?

|  |  |
| --- | --- |
| **a.** | 2 |
| **b.** | 7 |
| **c.** | 8 |
| **d.** | 9 |

**\_\_\_\_ 20. Use the graph above to answer the next question.**

What does the graph suggest about how pH affects enzyme activity?

|  |  |
| --- | --- |
| **a.** | pH does not affect enzyme activity |
| **b.** | enzymes function best at a low pH |
| **c.** | as pH increase, so does enzyme activity |
| **d.** | each enzyme has a specific pH range in which it works best |

**\_\_\_\_ 21.** Which of the following pairs of enzymes carry out opposite reactions to each other?

|  |  |
| --- | --- |
| **a.** | pepsin and trypsin |
| **b.** | lactase and maltase |
| **c.** | maltase and amylase |
| **d.** | kinase and phosphatase |



**\_\_\_\_ 22. Use the diagram above to answer the next question.**

The small triangles represent substrates and the large circles represent enzymes. Which of the following explains what happens as the reaction proceeds from scenario 1 to 2 to 3?

|  |  |
| --- | --- |
| **a.** | The rate of reaction stays the same. |
| **b.** | The rate of reaction decreases because there are too many substrates present. |
| **c.** | As the concentration of substrate increases, this will cause the pH to increase. |
| **d.** | As the concentration of substrate increases, the rate of reaction also increases. |

**\_\_\_\_ 23.** Which of the following explains how enzymes function in biochemical reactions?

|  |  |
| --- | --- |
| I | the change in the shape of the active site is permanent |
| II | the active site undergoes a change in shape to fit the substrate better |
| III | the substrate fits into the active site of the enzyme like a lock and key |

|  |  |
| --- | --- |
| **a.** | I and II only |
| **b.** | I and III only |
| **c.** | II and III only |
| **d.** | I, II, and III |

**\_\_\_\_ 24.** The digestion of ribonucleic acid is catalyzed by a polymer made up of which of the following molecules?

|  |  |
| --- | --- |
| **a.** | glucose |
| **b.** | nucleotides |
| **c.** | amino acids |
| **d.** | phospholipids |



**\_\_\_\_ 25. Use the diagram above to answer the next question.**

Less than half of the free energy of one of the reactants of this organelle is transformed into a energy-carrying nucleotide. The rest is

|  |  |
| --- | --- |
| **a.** | lost as heat. |
| **b.** | converted into ADP. |
| **c.** | is used to make phosphate. |
| **d.** | is broken down into a nucleic acid. |

**Chapter 5 Pre-Test (A)**

**Answer Section**

**MULTIPLE CHOICE**

 **1.** ANS: A PTS: 1 DIF: K REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-1 TOP: 5.1

KEY: Energy Transformations and Metabolism

 **2.** ANS: D PTS: 1 DIF: K REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B-S TOP: 5.1

KEY: Energy Transformations and Metabolism

 **3.** ANS: D PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B4-18 TOP: 5.1

KEY: Energy Transformations and Metabolism

 **4.** ANS: A PTS: 1 DIF: K REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B4-18 TOP: 5.1

KEY: Energy Transformations and Metabolism

 **5.** ANS: A PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-8 TOP: 5.3

KEY: Metabolic Rate and the Thyroid and Parathyroid Glands

 **6.** ANS: C PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-8 TOP: 5.3

KEY: Metabolic Rate and the Thyroid and Parathyroid Glands

 **7.** ANS: B PTS: 1 DIF: HMP REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-8 TOP: 5.3

KEY: Metabolic Rate and the Thyroid and Parathyroid Glands

 **8.** ANS: D PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-8 TOP: 5.3

KEY: Metabolic Rate and the Thyroid and Parathyroid Glands

 **9.** ANS: C PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B-S TOP: 5.3

KEY: Metabolic Rate and the Thyroid and Parathyroid Glands

 **10.** ANS: D PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-1 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **11.** ANS: C PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-1 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **12.** ANS: C PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-1 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **13.** ANS: A PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-1 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **14.** ANS: B PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B-S TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **15.** ANS: D PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-2 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **16.** ANS: D PTS: 1 DIF: K REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-3 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **17.** ANS: D PTS: 1 DIF: K REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-6 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **18.** ANS: B PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-6 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **19.** ANS: B PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-6 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **20.** ANS: D PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-6 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **21.** ANS: D PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-6 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **22.** ANS: D PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-6 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **23.** ANS: C PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-3 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **24.** ANS: C PTS: 1 DIF: U REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B11-1 TOP: 5.2

KEY: Enzymes and Metabolic Pathways

 **25.** ANS: A PTS: 1 DIF: HMP REF: 5

OBJ: Metabolism: Energy and Enzymes LOC: B-S TOP: 5.1

KEY: Energy Transformations and Metabolism