

## Nutrition, Metabolism, and Body Temperature Regulation

### 24.1 Matching Questions

*Match the following:*

- A) Electron transport chain
- B) Glycolysis
- C) Krebs cycle

- 8) Glucose serves as the initial reactant.
- 9) Involves the removal of hydrogen electrons and CO<sub>2</sub> from the substrate molecule.
- 10) Occurs in the cytosol of a cell.
- 11) Produces the most ATP.
- 12) Involves the use of oxygen to pick up excess hydrogen and electrons.

*Match the following:*

- A) ketogenesis
- B) lipolysis
- C) lipogenesis
- D) beta oxidation

- 17) Synthesis of lipids from glucose or amino acids.
- 18) Splitting of triglycerides into glycerol and fatty acids.
- 19) Conversion of fatty acids into acetyl groups.
- 20) Formation of ketone bodies.

### **24.2 True/False Questions**

- 4) The term *essential nutrient* refers to the chemicals that can be interconverted in the liver so that the body can maintain life and good health.
- 7) The body is considered to be in nitrogen balance when the amount of nitrogen ingested in lipids equals the amount excreted in urine.
- 14) In order for amino acids to be oxidized for energy, the amine group (NH<sub>2</sub>) must be removed.
- 18) Triglycerides and cholesterol do not circulate freely in the bloodstream.

21) Carbohydrate and fat pools are oxidized directly to produce cellular energy, but amino acid pools must first be converted to a carbohydrate intermediate before being sent through cellular respiration pathways.

### **24.3 Multiple-Choice Questions**

3) Which of the following is the major role of leptin in the body?

- A) promote weight loss with activity
- B) protect against weight loss during nutritional deprivation
- C) shrink fat stores
- D) decrease appetite and food intake

6) The term *metabolism* is best defined as \_\_\_\_\_.

- A) the length of time it takes to digest and absorb fats
- B) a measure of carbohydrate utilization, typically involving measurement of calories
- C) the number of calories it takes to keep from shivering on a cold day
- D) the sum of biochemical reactions involved in building breaking down molecules

11) Which of the choices below describes the pathway of cellular respiration (the complete oxidation of glucose)?

- A) glycolysis, Krebs cycle, electron transport chain, oxidative phosphorylation
- B) gluconeogenesis, Krebs cycle, lipolysis
- C) lipolysis, glycogenolysis, beta oxidation
- D) glycogenesis, lipogenesis, electron transport chain

17) Lipogenesis occurs when \_\_\_\_\_.

- A) there is a shortage of fatty acids
- B) glucose levels drop slightly
- C) excess proteins are transported through the cell membrane
- D) cellular ATP and glucose levels are high

23) Glycolysis is best defined as a catabolic reaction based upon the \_\_\_\_\_.

- A) conversion of glucose into carbon dioxide and water
- B) conversion of glucose into two molecules of pyruvic acid
- C) conversion of pyruvic acid into carbon dioxide and water
- D) formation of sugar

29) Which hormone directs essentially all the events of the absorptive state?

- A) growth hormone
- B) thyroid hormone
- C) epinephrine
- D) insulin

32) As the body progresses from the absorptive to the postabsorptive state, only the \_\_\_\_\_ continues to burn glucose while every other organ in the body mostly switches to fatty acids.

- A) liver
- B) brain

- C) pancreas
- D) spleen

38) When ketone bodies are present in the blood and urine in large amounts, it usually indicates increased metabolism of \_\_\_\_\_.

- A) amino acids
- B) fatty acids
- C) glycogen
- D) lactic acid

39) Many factors influence BMR. What is the most critical factor?

- A) the way an individual metabolizes fat
- B) the way skeletal muscles break down glycogen
- C) the ratio of surface area to volume (weight) of the body
- D) an individual's body weight

43) Which food type is considered to be the most important for athletes to eat to improve performance?

- A) simple sugars
- B) complex carbohydrates
- C) plant proteins
- D) animal proteins

47) Select the correct statement about proteins.

- A) Strict vegetarians need not worry about adequate protein intake, as most vegetables are almost perfect sources of amino acids.
- B) Proteins can be synthesized in the body if most of the amino acids are present.
- C) Proteins will be used by most cells for ATP synthesis if insufficient carbohydrates are ingested.
- D) Catabolic steroids (hormones) accelerate the rate of protein synthesis.

53) Conditions that promote the oxidative deamination and energy use of amino acids include \_\_\_\_\_.

- A) adequate essential amino acids
- B) adequate fat calories to provide adequate ATP formation
- C) excessive amounts of protein in the diet
- D) ammonia combining with oxygen to form urea

57) Which of the following best defines *negative nitrogen balance*?

- A) Protein breakdown exceeds protein synthesis.
- B) It is a condition usually caused by having a diet low in fish and meat.
- C) A negative nitrogen balance is normal and is a way of maintaining homeostasis.
- D) It occurs when amino acids are broken down by liver enzymes and carried to the bloodstream.

#### **24.4 Fill-in-the-Blank/Short Answer Questions**

1) The Krebs cycle produces \_\_\_\_\_ ATP molecules per glucose molecule by substrate-level phosphorylation.

6) The process of splitting glucose through a series of steps that produces two pyruvic acid molecules is called \_\_\_\_\_.

11) Define *amino acid pool* and explain how the pool is maintained even though we excrete amino acids daily.

17) Define *nitrogen balance*. List three factors that might lead to negative nitrogen balance and three that might result in positive nitrogen balance.