1. Which statement MOST precisely reflects the conceptual origin of the term “carbohydrate” as presented?

A. It strictly indicates that carbohydrates chemically contain water molecules bonded within their structure.

B. It originates from the idea of carbon atoms hydrated with water, expressed empirically rather than structurally.

C. It defines carbohydrates as polymers exclusively composed of hydrated carbon chains.

D. It implies that all carbohydrates are derived from aqueous metabolic pathways.

2. The expression $(CH_2O)_n$ is BEST interpreted as:

A. A universal structural formula valid for all carbohydrate derivatives without exception.

B. An empirical representation that does not necessarily apply to all carbohydrate variants.

C. A strict molecular requirement for classification as a monosaccharide.

D. A formula that distinguishes carbohydrates from lipids and proteins structurally.

3. Which of the following BEST captures the biological versatility of carbohydrates?

A. They function solely as an immediate energy source.

B. They participate only in structural roles within cells.

C. They contribute to energy, storage, and formation of biological molecules such as genes and drugs.

D. They are limited to metabolic pathways without involvement in transport.

4. Which classification sequence is MOST consistent with increasing structural complexity?

A. Disaccharides → Monosaccharides → Polysaccharides → Oligosaccharides

B. Monosaccharides → Disaccharides → Oligosaccharides → Polysaccharides

C. Oligosaccharides → Monosaccharides → Disaccharides → Polysaccharides

D. Polysaccharides → Monosaccharides → Disaccharides → Oligosaccharides

5. Which statement BEST differentiates oligosaccharides from polysaccharides based on the slides?

A. Oligosaccharides contain exactly two monosaccharide units.

B. Polysaccharides are limited to fewer than ten monosaccharide units.

C. Oligosaccharides typically consist of up to 9–10 monosaccharide units.

D. Polysaccharides cannot form covalent bonds.

6. Which of the following is MOST consistent with the definition of a monosaccharide?

A. A molecule composed of two monosaccharides linked by a glycosidic bond.

B. A carbohydrate that cannot be hydrolyzed into simpler units.

C. A polymer of repeating sugar units.

D. A molecule containing only ketone groups.

7. Which classification BEST describes glucose based on the slides?

A. Ketose monosaccharide

B. Aldose monosaccharide

C. Disaccharide

D. Oligosaccharide

8. Which statement about glycosidic bonds is MOST precise according to the slides?

A. They are exclusively ionic interactions between sugars.

B. They are covalent linkages that can involve oxygen or nitrogen atoms.

C. They exist only in polysaccharides.

D. They are formed only between identical monosaccharides.

9. Which of the following BEST describes maltose?

A. A disaccharide composed of glucose and fructose linked via $\alpha(1\rightarrow2)$.

B. A disaccharide of two glucose molecules linked via $\alpha(1\rightarrow4)$.

C. A disaccharide of galactose and glucose linked via $\beta(1\rightarrow4)$.

D. A monosaccharide polymer.

10. Which statement MOST accurately describes sucrose?

A. It consists of two glucose units linked by $\alpha(1\rightarrow4)$.

B. It links glucose and fructose through their anomeric carbons.

C. It contains a $\beta(1\rightarrow4)$ linkage between galactose and glucose.

D. It is classified as a polysaccharide.

11. Which feature BEST distinguishes amylose?

A. Presence of $\beta(1\rightarrow4)$ linkages

B. Branched glucose structure

C. Linear polymer with $\alpha(1\rightarrow4)$ linkages

D. Composed of mixed monosaccharides

12. The physiological advantage of storing glucose as starch is BEST explained by:

A. Increasing reactivity of glucose molecules

B. Enhancing diffusion across membranes

C. Minimizing osmotic effects

D. Preventing enzymatic digestion

13. Which definition BEST matches the reducing end of a polysaccharide?

A. The terminal unit lacking any hydroxyl groups

B. The end where the anomeric carbon is involved in bonding

C. The end with a free anomeric carbon not involved in a glycosidic bond

D. The branching point of the polymer

14. Which statement BEST defines epimers?

A. Sugars that are mirror images at all carbons

B. Sugars differing in configuration at a single specific carbon

C. Sugars with identical structures

D. Sugars differing only in molecular weight

15. Which statement BEST describes enantiomers?

A. Sugars differing at only one carbon

B. Sugars that are structural isomers

C. Sugars that are mirror images of each other

D. Sugars differing in chain length

16. The α and β forms of sugars differ in:

A. Number of carbon atoms

B. Position of the carbonyl group

C. Configuration at the anomeric carbon

D. Type of glycosidic bond

17. Carbohydrate digestion begins in the mouth due to:

A. Pancreatic amylase

B. Salivary α-amylase

C. Gastric enzymes

D. Intestinal enzymes

18. Why does carbohydrate digestion stop in the stomach?

A. Absence of carbohydrates

B. Lack of digestive enzymes

C. Inactivation of amylase by acidity

D. Presence of bile salts

19. Where does further digestion of carbohydrates primarily occur?

A. Mouth

B. Stomach

C. Small intestine

D. Large intestine

20. Which statement BEST describes the consequence of disaccharidase deficiency?

A. Increased monosaccharide absorption

B. Accumulation of undigested carbohydrates in the intestine

C. Decreased osmotic activity

D. Reduced bacterial fermentation

Answer Key

1. B
2. B
3. C
4. B
5. C
6. B
7. B
8. B
9. B
10. B
11. C
12. C

13. C
14. B
15. C
16. C
17. B
18. C
19. C
20. B