Advanced Dietetics Fundamentals

Dietetics · Answer Key · 8 Questions

1. Which of the following is a primary function of the enzyme phosphofructokinase-1 (PFK-1) in cellular respiration?

A) Catalysing the irreversible conversion of fructose-1,6-bisphosphate to glyceraldehyde-3-phosphate.

B) Regulating the rate-limiting step of glycolysis by phosphorylating fructose-6-phosphate.

C) Facilitating the breakdown of glucose into pyruvate during the initial stages of glucose metabolism.

D) Generating ATP through substrate-level phosphorylation in the Krebs cycle.

2. What is the primary role of apolipoprotein B-100 (ApoB-100) in lipid transport?

A) It is a component of HDL responsible for reverse cholesterol transport.

B) It serves as the primary ligand for the LDL receptor, mediating cellular uptake of LDL particles.

C) It is essential for the assembly and secretion of chylomicrons from enterocytes.

D) It activates lipoprotein lipase (LPL) to hydrolyze triglycerides in circulating lipoproteins.

3. In the context of micronutrient metabolism, which vitamin is a crucial cofactor for enzymes involved in the carboxylation of glutamate residues, essential for blood clotting factors?

A) Vitamin C (Ascorbic Acid)

B) Vitamin K

C) Vitamin A (Retinol)

D) Vitamin D (Calciferol)

4. What is the principal mechanism by which dietary fiber influences blood glucose levels?

A) Directly increasing insulin secretion from pancreatic beta cells.

B) Accelerating gastric emptying and thus the rate of glucose absorption.

C) Reducing the rate of glucose absorption from the small intestine by increasing viscosity.

D) Enhancing glucose uptake by peripheral tissues through improved insulin sensitivity.

5. Which dietary component is the primary precursor for the synthesis of endogenous cholesterol in the liver?

A) Dietary cholesterol itself

B) Dietary carbohydrates

C) Dietary fatty acids

D) Dietary amino acids

6. The role of the liver in carbohydrate metabolism includes gluconeogenesis. What is the primary substrate for gluconeogenesis during fasting or prolonged exercise?

A) Glucose-6-phosphate
B) Pyruvate
C) Lactate and glycerol
D) Fructose-1,6-bisphosphate

7. Which of the following amino acids is considered conditionally essential, meaning its synthesis can be insufficient to meet the body's needs under certain physiological conditions like illness or rapid growth?

A) Leucine
B) Lysine
C) Glutamine
D) Valine

8. In the absorption of fat-soluble vitamins (A, D, E, K), which of the following is a critical requirement for efficient uptake?

A) Presence of intrinsic factor in the stomach.
B) Adequate secretion of bile salts into the small intestine.
C) High levels of pancreatic amylase activity.
D) Low pH in the duodenum to activate enzymes.