

NDLE BOARD NUTRITIONAL BIOCHEMISTRY AND CLINICAL DIETETICS EXAM 1 PRACTICE (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

**VISIT US ONLINE FOR
THE FULL VERSION STUDY GUIDE**

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Table of Contents

Copyright	1
Table of Contents	2
Introduction	3
How to Use This Guide	4
Questions	5
Answers	8
Explanations	10
Next Steps	15

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Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

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- 1. The most abundant protein in the human blood plasma is:**
 - A. Fibrinogen
 - B. Globulin
 - C. Albumin
 - D. Hemoglobin
- 2. Excess dietary protein is:**
 - A. Excreted directly in the urine
 - B. Stored in the body
 - C. All of the above
 - D. Broken down for energy or used to synthesize glucose and fat
- 3. Which pharmacologic agent is commonly recommended to reduce the risk of developing diabetes in high-risk adults?**
 - A. Metformin
 - B. Insulin
 - C. Sulfonylureas
 - D. Glucagon
- 4. Which energy-providing component is commonly used in parenteral nutrition solutions?**
 - A. Glucose solution
 - B. Lipids
 - C. Essential amino acids
 - D. Nonessential amino acids
- 5. The transport form of fat in the body after digestion and absorption:**
 - A. Very low-density lipoproteins
 - B. Low-density lipoproteins
 - C. High-density lipoproteins
 - D. Chylomicrons

- 6. Which hormone controls the sodium output of the kidney?**
- A. ADH
 - B. Renin
 - C. Natriuretic peptide
 - D. Aldosterone
- 7. Which combination of macronutrients provides the protein-sparing effect when caloric intake is adequate?**
- A. Carbohydrate and fat
 - B. Protein and carbohydrate
 - C. Fat and protein
 - D. Vitamins and minerals
- 8. Involved in nerve impulse transmission except:**
- A. Zinc
 - B. Sodium
 - C. Magnesium
 - D. Calcium
- 9. A severely underweight teenager diagnosed as anorexia nervosa was referred for tube feeding. The total kilocalorie intake should be based on:**
- A. height
 - B. amount of weight loss
 - C. current weight
 - D. age
- 10. Complexes of lipids and proteins responsible for transport and distribution of lipids in the lymph and blood are called**
- A. Lipid droplets
 - B. Albumin
 - C. Glycoproteins
 - D. Lipoproteins

Answers

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1. C
2. D
3. A
4. A
5. D
6. D
7. A
8. A
9. B
10. D

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Explanations

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1. The most abundant protein in the human blood plasma is:

- A. Fibrinogen
- B. Globulin
- C. Albumin**
- D. Hemoglobin

Albumin is the most abundant protein in human blood plasma. It's produced by the liver and makes up roughly 60% of the total plasma protein, at concentrations around 35–50 g/L in healthy adults. Its main job is to maintain colloid osmotic pressure, keeping fluid inside the blood vessels and preventing edema. Albumin also acts as a versatile carrier, binding and transporting many substances such as fatty acids, bilirubin, hormones, electrolytes, and various drugs. Fibrinogen and the globulin fraction are present but at lower levels; fibrinogen is mainly a clotting factor, and globulins include various transport proteins and immunoglobulins. Hemoglobin is contained within red blood cells, not in plasma. Hence, albumin is the correct answer.

2. Excess dietary protein is:

- A. Excreted directly in the urine
- B. Stored in the body
- C. All of the above
- D. Broken down for energy or used to synthesize glucose and fat**

When protein is eaten in excess, the body doesn't store amino acids as extra protein. Instead, amino acids are deaminated in the liver, removing the nitrogen (which is then excreted as urea). The remaining carbon skeletons can be used for energy or redirected into glucose production (gluconeogenesis) or fat synthesis (lipogenesis) if energy intakes are high. That's why the correct idea is that excess protein is broken down for energy or used to make glucose and fat. If needed, some amino acids can be reused for other nonprotein compounds, but there's no stored "reserve" of amino acids like there is for fat or carbohydrate.

3. Which pharmacologic agent is commonly recommended to reduce the risk of developing diabetes in high-risk adults?

- A. Metformin**
- B. Insulin
- C. Sulfonylureas
- D. Glucagon

Metformin is the pharmacologic option shown to reduce progression to type 2 diabetes in adults who are at high risk. It works by improving insulin sensitivity and decreasing hepatic glucose production, which helps prevent the switch from prediabetes to overt diabetes. Evidence from major trials shows a meaningful reduction in risk, though lifestyle changes generally have a larger effect; metformin remains a practical preventive choice, especially for younger individuals, those with higher BMI, or women with a history of gestational diabetes. Insulin is used to treat diabetes, not to prevent it. Sulfonylureas stimulate insulin release and carry hypoglycemia risk, so they aren't used for prevention, and glucagon is used for treating severe hypoglycemia, not preventing diabetes.

4. Which energy-providing component is commonly used in parenteral nutrition solutions?

- A. Glucose solution**
- B. Lipids
- C. Essential amino acids
- D. Nonessential amino acids

In parenteral nutrition, energy is provided mainly by carbohydrates because they're readily metabolized to meet daily energy needs. A glucose (dextrose) solution is the most common base energy source in PN formulations, delivering quick, controllable calories and allowing other components—like amino acids for protein synthesis and lipids for additional energy and essential fatty acids—to be added as needed. Lipids do contribute substantial energy and essential fatty acids, but they are usually given as a separate emulsion to round out energy intake, not as the primary energy source. Amino acids supply nitrogen and building blocks for tissues, with energy contribution being secondary. Therefore, glucose solution is the typical energy-providing component in parenteral nutrition.

5. The transport form of fat in the body after digestion and absorption:

- A. Very low-density lipoproteins
- B. Low-density lipoproteins
- C. High-density lipoproteins
- D. Chylomicrons**

After fats are digested and absorbed, they are packaged into chylomicrons. In enterocytes, fatty acids and monoglycerides are reassembled into triglycerides and combined with apolipoprotein B-48 to form these lipoproteins. Chylomicrons then enter the lymphatic system via the lacteals and travel through the lymph before reaching the bloodstream, delivering triglycerides to tissues via lipoprotein lipase. The remaining chylomicron remnants are cleared by the liver. Other lipoproteins—VLDL, LDL, and HDL—are involved in transport of endogenous lipids or cholesterol, not the immediate transport of dietary fat after absorption.

6. Which hormone controls the sodium output of the kidney?

- A. ADH
- B. Renin
- C. Natriuretic peptide
- D. Aldosterone**

Sodium handling in the kidney is governed by aldosterone acting on the distal nephron. It binds to mineralocorticoid receptors in principal cells of the distal tubule and collecting duct, increasing the transcription and activity of epithelial sodium channels (ENaC) and Na⁺/K⁺ ATPase pumps. This boosts sodium reabsorption back into the bloodstream and promotes potassium secretion, so less sodium is lost in the urine. The result is a reduction in sodium output and a contribution to fluid and blood pressure regulation. Other hormones have different primary roles: ADH mainly controls water reabsorption; renin is an upstream trigger of the RAAS that ultimately raises aldosterone; natriuretic peptides promote sodium excretion, increasing sodium output. Thus aldosterone is the direct hormone that best controls sodium output.

7. Which combination of macronutrients provides the protein-sparing effect when caloric intake is adequate?

- A. Carbohydrate and fat**
- B. Protein and carbohydrate
- C. Fat and protein
- D. Vitamins and minerals

Protein-sparing happens when the body has enough calories from non-protein sources to meet energy needs, so amino acids can be used for tissue building rather than fuel. When energy comes from carbohydrates and fats, the body doesn't need to break down body protein for energy, preserving lean mass and supporting growth and repair. Carbohydrate provides readily available glucose for energy, while fat supplies dense, long-lasting energy. Together they meet caloric requirements, keeping protein free for its structural and functional roles. Vitamins and minerals don't supply energy, so they can't produce this sparing effect. Without adequate non-protein calories, protein would be diverted to energy production, undermining the sparing effect.

8. Involved in nerve impulse transmission except:

- A. Zinc**
- B. Sodium
- C. Magnesium
- D. Calcium

Nerve impulses rely on specific ions moving across nerve membranes to generate and transmit signals. The rapid influx of sodium ions through voltage-gated sodium channels drives depolarization and the action potential itself. Calcium ions play a separate but essential role at the synapse: when an action potential reaches the presynaptic terminal, calcium channels open and Ca^{2+} influx triggers neurotransmitter release into the synaptic cleft. Magnesium helps modulate excitability by stabilizing membranes and limiting calcium entry through certain channels and receptors, effectively dampening excessive neuronal firing. Zinc, while present in the nervous system and capable of modulating synaptic activity in some pathways, is not a primary ion responsible for creating or propagating the action potential or for the standard release mechanism at the synapse. It is not part of the core ionic mechanism of nerve impulse transmission, making it the exception here.

9. A severely underweight teenager diagnosed as anorexia nervosa was referred for tube feeding. The total kilocalorie intake should be based on:

- A. height
- B. amount of weight loss**
- C. current weight
- D. age

The key idea is that energy needs for refeeding a severely underweight adolescent with anorexia nervosa are guided by the degree of energy deficit, which is reflected by how much weight has been lost. The more weight that has been lost, the greater the deficit that needs to be addressed to restore weight toward a healthy range. Therefore, total kilocalorie intake for tube feeding is based on the amount of weight loss to ensure you reverse the deficit safely and effectively. Height, current weight, and age don't directly capture how far below normal weight the person is or how large a deficit has accumulated. Height doesn't indicate how much energy has been depleted; current weight alone doesn't reveal the prior extent of weight loss or deficit; age influences metabolic rate but not the specific deficit that needs to be corrected. By contrast, weight loss directly informs how aggressively to restore calories, within safety limits to monitor for refeeding syndrome.

10. Complexes of lipids and proteins responsible for transport and distribution of lipids in the lymph and blood are called

- A. Lipid droplets
- B. Albumin
- C. Glycoproteins

D. Lipoproteins

Lipoproteins are the structures that allow lipids to travel through watery environments like lymph and blood by forming a particle with a hydrophobic lipid core surrounded by a polar surface. The core mainly contains triglycerides and cholesteryl esters, while the surface is made of phospholipids, free cholesterol, and specific proteins called apolipoproteins. This arrangement makes lipids soluble enough to circulate, and the types of lipoproteins (such as chylomicrons from the intestine, and VLDL, LDL, HDL from the liver) differ in density and composition, guiding delivery to tissues or removal from circulation. Chylomicrons enter the lymph as they transport dietary lipids; in blood they are processed into remnants. HDL is involved in reverse cholesterol transport, helping return cholesterol to the liver. While albumin can bind free fatty acids and some lipids for transport, it does not form the lipid-protein complexes that circulate as lipoproteins. Lipid droplets are intracellular storage forms, not circulating carriers, and glycoproteins are proteins with carbohydrate attachments, not the lipid-carrying particles described here.

Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

<https://ndlenutbiochemclindietetics1.examzify.com>

We wish you the very best on your exam journey. You've got this!

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