

NBME HISTOLOGY PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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. Which skin component most contributes to the skin's barrier against water loss?**
 - A. Desmosomes between keratinocytes
 - B. Thick stratum corneum
 - C. Keratinization of cells and lipid envelopes
 - D. Thick epidermal basement membrane

- 2. Podocytes are specialized cells associated with which structure in the kidney?**
 - A. Mesangial cells
 - B. Podocytes
 - C. Endothelial cells
 - D. Macula densa

- 3. Which gastric cell type secretes intrinsic factor?**
 - A. Chief cells
 - B. Mucous neck cells
 - C. Enteroendocrine cells
 - D. Parietal (oxyntic) cells

- 4. In glands with mixed serous and mucous acini, what histologic feature indicates serous demilunes?**
 - A. Crescent-Shaped Serous Demilunes Cap Mucous Acini
 - B. Uniform Mucinous Acini With No Serous Cells
 - C. Serous Demilunes Are Round Clusters Of Mucous Cells
 - D. All Acini Are Serous Secretory Units

- 5. Pancreatic acinar cells secrete digestive enzymes. What is a characteristic cytoplasmic feature of these cells?**
 - A. Large lipid droplets
 - B. Abundant mitochondria with basophilic cytoplasm and no granules
 - C. Eosinophilic cytoplasm with perinuclear clear area
 - D. Basally located nuclei with basophilic cytoplasm and apical zymogen granules

- 6. Which cells provide the supportive environment for neurons?**
- A. Glial support cells.
 - B. Fibroblasts.
 - C. Epithelial cells.
 - D. Smooth muscle cells.
- 7. Which gland's development is linked to the third pharyngeal pouch and is essential for T cell development?**
- A. Thymus
 - B. Parathyroid
 - C. Larynx
 - D. Esophagus
- 8. Endometrial hyperplasia is most directly associated with signaling through which receptor?**
- A. Estrogen receptor
 - B. Androgen receptor
 - C. Progesterone receptor
 - D. Glucocorticoid receptor
- 9. Liver histology shows hepatocytes with eosinophilic cytoplasm and nuclear fragmentation; which process is most likely occurring?**
- A. Necrosis
 - B. Metaplasia
 - C. Apoptosis
 - D. Dysplasia
- 10. In adults, which is the primary site of hematopoiesis?**
- A. Yellow bone marrow
 - B. Spleen
 - C. Red bone marrow
 - D. Lymph nodes

Answers

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

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Explanations

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1. Which skin component most contributes to the skin's barrier against water loss?

- A. Desmosomes between keratinocytes
- B. Thick stratum corneum
- C. Keratinization of cells and lipid envelopes**
- D. Thick epidermal basement membrane

The main idea being tested is how the outermost epidermal layer prevents water loss. The barrier is formed by keratinized, flattened cells in the stratum corneum that are surrounded by a lipid-rich envelope. Keratinization makes these corneocytes tough, compact, and effectively dead, so they stack tightly like bricks. The lipids that surround and fill the spaces between these cells act as a hydrophobic mortar, greatly reducing water diffusion through the skin. This combination—the keratinized cells plus their surrounding lipid envelopes—provides the most effective barrier to transepidermal water loss. Desmosomes mainly hold cells together and contribute to structure, not the primary barrier. The basement membrane lies below the epidermis and is not the key player in preventing water loss.

2. Podocytes are specialized cells associated with which structure in the kidney?

- A. Mesangial cells
- B. Podocytes**
- C. Endothelial cells
- D. Macula densa

Podocytes are specialized epithelial cells that form the visceral layer of Bowman's capsule and intimately wrap around the glomerular capillaries. Their foot processes interdigitate, creating filtration slits bridged by slit diaphragms, which are essential to the glomerular filtration barrier. This arrangement prevents large proteins from entering the filtrate while allowing water and small solutes to pass, so podocytes are fundamentally linked to the glomerulus—the filtration unit of the kidney.

3. Which gastric cell type secretes intrinsic factor?

- A. Chief cells
- B. Mucous neck cells
- C. Enteroendocrine cells
- D. Parietal (oxyntic) cells**

Intrinsic factor is produced by parietal (oxyntic) cells in the stomach. These acid-secreting cells not only release hydrochloric acid to help digest proteins and create an acidic environment, but they also secrete intrinsic factor, a glycoprotein essential for the intestinal absorption of vitamin B12 in the terminal ileum. Other gastric cell types have different roles: chief cells secrete pepsinogen, mucous neck cells produce protective mucus, and enteroendocrine cells release hormones like gastrin. Without intrinsic factor, vitamin B12 cannot be effectively absorbed, leading to pernicious anemia despite adequate intake.

4. In glands with mixed serous and mucous acini, what histologic feature indicates serous demilunes?

- A. Crescent-Shaped Serous Demilunes Cap Mucous Acini**
- B. Uniform Mucinous Acini With No Serous Cells
- C. Serous Demilunes Are Round Clusters Of Mucous Cells
- D. All Acini Are Serous Secretory Units

In mixed glands, serous demilunes show up as a crescent-shaped cap of serous cells that overlay the mucous acinus. The mucous portion stains lighter because it's mucin-rich, while the serous cells around it contain zymogen granules and stain darker. That crescent of darker, serous cells sitting on the mucous tubule is the telltale sign you're looking at serous demilunes. If you only had uniform mucous acini, you wouldn't see any serous demilunes. If demilunes were described as round clusters of mucous cells, that would misstate their composition and appearance. And if every acinus were serous, there would be no demilunes at all since that feature marks a mixed gland.

5. Pancreatic acinar cells secrete digestive enzymes. What is a characteristic cytoplasmic feature of these cells?

- A. Large lipid droplets
- B. Abundant mitochondria with basophilic cytoplasm and no granules
- C. Eosinophilic cytoplasm with perinuclear clear area
- D. Basally located nuclei with basophilic cytoplasm and apical zymogen granules**

Pancreatic acinar cells are professional secretory cells of the exocrine pancreas. They synthesize large amounts of digestive enzyme precursors and package them into membrane-bound zymogen granules that sit at the apical part of the cell, ready to be released into the duct system. To support this heavy protein production, these cells have abundant rough endoplasmic reticulum, which makes the cytoplasm appear basophilic on staining. The nucleus is typically located toward the base of the cell, which leaves room for the busy apical region filled with secretory granules. This combination—basally located nuclei, basophilic cytoplasm from the rough ER, and apical zymogen granules—best matches the characteristic cytoplasmic feature of pancreatic acinar cells.

6. Which cells provide the supportive environment for neurons?

- A. Glial support cells.**
- B. Fibroblasts.
- C. Epithelial cells.
- D. Smooth muscle cells.

Neurons rely on neighboring non-neuronal cells to create a nourishing and protective environment that supports signaling and health. Glial cells do this work: they provide structural support, regulate the extracellular environment, supply metabolic fuel, maintain ion balance, and insulate axons to speed electrical conduction. In the central nervous system, astrocytes help form the blood-brain barrier, take up excess potassium and neurotransmitters at synapses, and shuttle nutrients to neurons. They also give rise to myelin-forming cells in the CNS and assist with repair. Oligodendrocytes myelinate axons in the CNS, while Schwann cells do so in the peripheral nervous system, both increasing conduction speed. Microglia act as resident immune cells, clearing debris and responding to injury. In contrast, fibroblasts, epithelial cells, and smooth muscle cells serve other roles not specific to supporting neuronal function: fibroblasts build connective tissue, epithelial cells line surfaces and cavities, and smooth muscle cells manage contraction. Their activities don't establish the specialized microenvironment that neurons require for efficient signaling, nourishment, and protection.

7. Which gland's development is linked to the third pharyngeal pouch and is essential for T cell development?

- A. Thymus**
- B. Parathyroid
- C. Larynx
- D. Esophagus

Thymus is the gland whose development is tied to the third pharyngeal pouch and is essential for T cell maturation. The thymus arises from the third pharyngeal pouch during embryogenesis, setting up the environment where precursor cells from the bone marrow migrate and differentiate into T lymphocytes. Within the thymus, thymic epithelial cells create a specialized microenvironment: cortical regions support positive selection to ensure T cells can recognize self-MHC, while medullary regions enable negative selection to eliminate self-reactive clones, establishing central tolerance. While the inferior parathyroid glands also originate from the third pouch, their role is calcium regulation, not T cell development. The remaining structures listed do not participate in thymic T cell maturation.

8. Endometrial hyperplasia is most directly associated with signaling through which receptor?

- A. Estrogen receptor**
- B. Androgen receptor
- C. Progesterone receptor
- D. Glucocorticoid receptor

Endometrial hyperplasia results from estrogen signaling through the estrogen receptor, which acts as a nuclear transcription factor to drive endometrial cell proliferation. When estrogen binds its receptor in the endometrium, it promotes transcription of genes that push the glands and stroma to grow, increasing glandular density and thickening of the lining. In a normal cycle, progesterone dampens this proliferative effect and promotes secretory maturation, helping to limit unchecked growth. When estrogen is unopposed—such as with anovulatory cycles, obesity with more peripheral estrogen production, or estrogen therapy without progestin—the proliferative signal via the estrogen receptor runs unchecked, leading to endometrial hyperplasia. The other receptors listed are not the primary drivers of this proliferative change in the endometrium.

9. Liver histology shows hepatocytes with eosinophilic cytoplasm and nuclear fragmentation; which process is most likely occurring?

- A. Necrosis
- B. Metaplasia
- C. Apoptosis**
- D. Dysplasia

Programmed cell death, or apoptosis, presents with coordinated cellular changes where the cell shrinks, the chromatin condenses, and the nucleus fragments into small pieces (karyorrhexis). The cytoplasm often becomes densely eosinophilic as proteins denature and organize during this process, and the dying cell breaks into apoptotic bodies that are promptly cleared by phagocytes. In the liver, hepatocytes showing eosinophilic cytoplasm with nuclear fragmentation fit this pattern, and are sometimes described as apoptotic hepatocytes or Councilman bodies in the setting of liver injury. This orderly death contrasts with necrosis, which involves cell swelling, loss of membrane integrity, and an inflammatory response; metaplasia refers to a change in cell type, and dysplasia denotes disordered growth without the specific nuclear fragmentation seen in apoptosis.

10. In adults, which is the primary site of hematopoiesis?

- A. Yellow bone marrow
- B. Spleen
- C. Red bone marrow**
- D. Lymph nodes

Blood cell production in adults occurs mainly in red bone marrow. This tissue is rich in hematopoietic stem cells that give rise to erythrocytes, leukocytes, and platelets. In adults, red marrow is primarily in the axial skeleton (vertebrae, pelvis, sternum, ribs, skull) and the ends of long bones. Over time, much of red marrow is replaced by yellow marrow, which is adipose tissue and has little hematopoietic activity. The spleen and lymph nodes are not the normal sites of hematopoiesis in healthy adults; the spleen can contribute to hematopoiesis only in certain settings (extramedullary hematopoiesis) or during fetal development. Lymph nodes are involved in immune responses, not blood cell production. So the primary site is red bone marrow.

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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://nbmehistology.examzify.com>

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

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