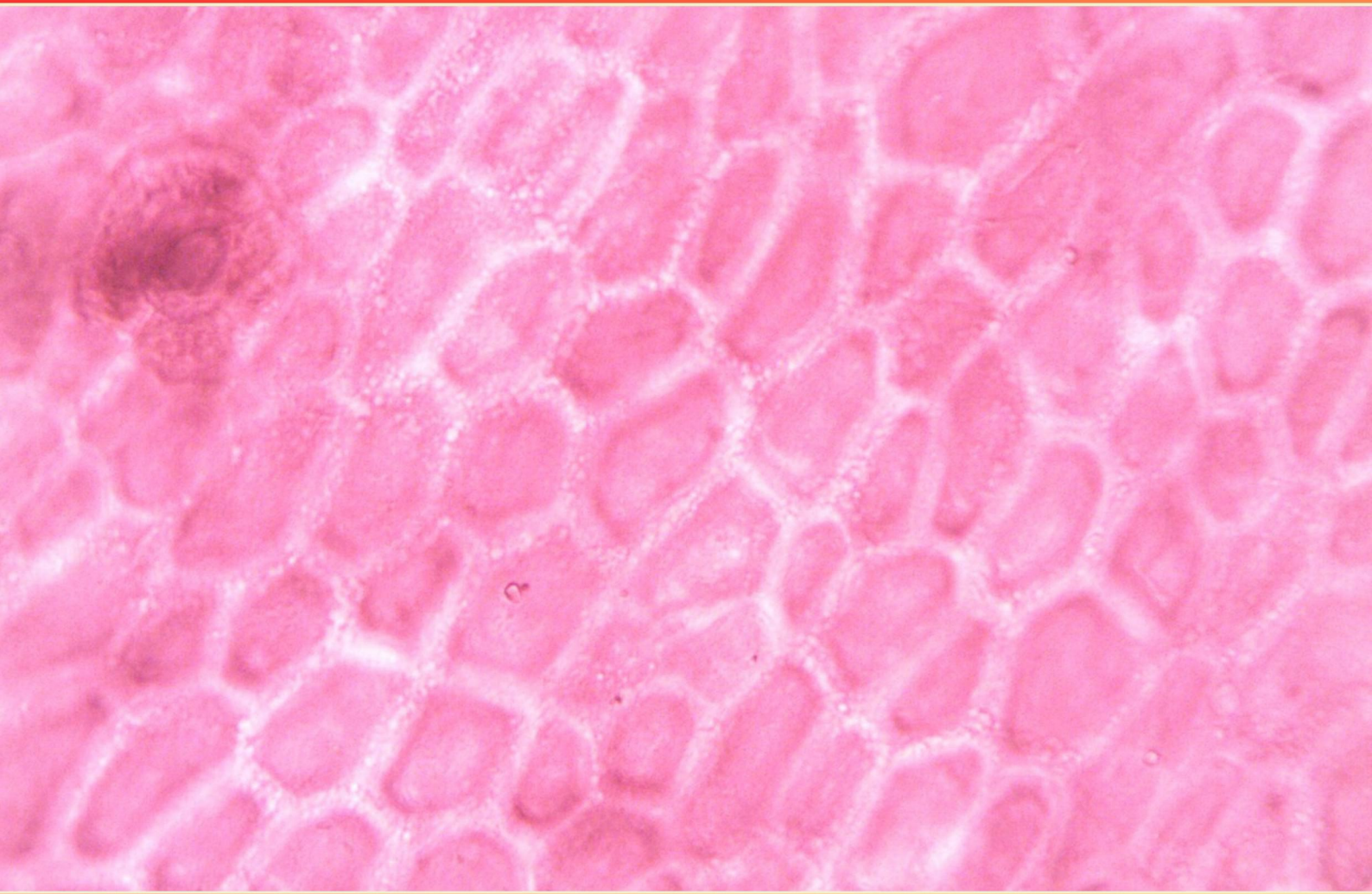


RODAK'S HEMATOLOGY PRACTICE EXAM (SAMPLE)

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	16

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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. What hexose monophosphate shunt product aids in the detoxification of peroxides in RBCs?**
 - A. ATP
 - B. 2,3-BPG
 - C. Pyruvic and lactic acid
 - D. NADPH and reduced glutathione
- 2. What determines the timing of egress of RBCs from the bone marrow?**
 - A. Maturing normoblasts slowly lose receptors for adhesive molecules
 - B. Stromal cells decrease production of adhesive molecules over time
 - C. Endothelial cells of the venous sinus form pores at intervals
 - D. Periodic apoptosis of pronormoblasts occurs
- 3. The laboratory purchases reagents from a manufacturer and develops an assay using standard references. What FDA category is this assay?**
 - A. Cleared
 - B. Home-brew
 - C. Research use only
 - D. Analyte-specific reagent
- 4. What large cells with multiple nuclei are noted in bone marrow core biopsy close to the endosteum?**
 - A. Megakaryocytes
 - B. Osteoclasts
 - C. Adipocytes
 - D. Fibroblasts
- 5. Which cell stage is responsible for producing mature erythrocytes?**
 - A. Pronormoblast
 - B. Polychromatophilic normoblast
 - C. Orthochromic normoblast
 - D. Myeloblast

6. In a patient with chronic intestinal bleeding due to aspirin use, what does a ferritin level of 25 ng/mL and a TIBC of 405 mg/dL indicate?
- A. Latent iron deficiency
 - B. Functional iron deficiency
 - C. Iron deficiency
 - D. Equivocal for iron deficiency
7. If undiluted spinal fluid shows a total of 105 RBCs counted, what is the concentration of RBCs per mL in a total volume counted?
- A. 131
 - B. 263
 - C. 1050
 - D. 5830
8. What type of anemia is associated with low reticulocyte count?
- A. Hemolytic anemia
 - B. Microcytic anemia
 - C. Aplastic anemia
 - D. Megaloblastic anemia
9. When performing a receiver operating curve analysis, what parameter assesses the overall efficacy of an assay?
- A. Area under the curve
 - B. Performance limit (threshold)
 - C. Positive predictive value
 - D. Negative predictive value
10. The crystals identified in a cloudy straw-colored fluid from a patient's big toe that appeared needle-shaped are:
- A. Cholesterol
 - B. Hyaluronidase
 - C. Monosodium urate
 - D. Calcium pyrophosphate

Answers

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

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Explanations

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1. What hexose monophosphate shunt product aids in the detoxification of peroxides in RBCs?

- A. ATP
- B. 2,3-BPG
- C. Pyruvic and lactic acid
- D. NADPH and reduced glutathione**

The hexose monophosphate shunt, also known as the pentose phosphate pathway, plays a critical role in the metabolism of glucose and is particularly important in red blood cells (RBCs) for maintaining the integrity and function of these cells. One of the key products of this pathway is NADPH. NADPH is essential for the detoxification of reactive oxygen species, including hydrogen peroxide (H_2O_2), which can be harmful to RBCs. This detoxification process involves the conversion of hydrogen peroxide into water, a reaction that is facilitated by the enzyme glutathione peroxidase. In this context, glutathione, which exists in a reduced form (reduced glutathione, or GSH), also plays a vital role in protecting cells from oxidative damage. NADPH is required to maintain the supply of reduced glutathione, thus allowing RBCs to effectively scavenge and neutralize peroxides. This connection explains why the correct answer includes both NADPH and reduced glutathione, as their combined action enables RBCs to detoxify peroxides effectively and prevent oxidative stress, promoting cellular longevity and function.

2. What determines the timing of egress of RBCs from the bone marrow?

- A. Maturing normoblasts slowly lose receptors for adhesive molecules**
- B. Stromal cells decrease production of adhesive molecules over time
- C. Endothelial cells of the venous sinus form pores at intervals
- D. Periodic apoptosis of pronormoblasts occurs

The timing of the egress of red blood cells (RBCs) from the bone marrow is primarily influenced by the process by which maturing normoblasts gradually lose their receptors for adhesive molecules. During erythropoiesis, as normoblasts transition to reticulocytes, there is a downregulation of these adhesion receptors, which facilitates their release into the bloodstream. This losing of adhesion allows the mature RBCs to detach from the bone marrow stroma and enter the circulation effectively. This mechanism ensures that only fully matured and functionally adequate RBCs are released into the bloodstream, optimizing oxygen delivery and maintaining normal physiological levels. The regulation of adhesion molecules is crucial in ensuring a balance between the retention of immature cells within the marrow and the timely release of mature ones. Other options suggest processes that are less central to the main mechanism at play in the timing of egress. While stromal cells and endothelial cells do play a role in the bone marrow microenvironment, their contributions are more related to the overall support and structure of the marrow rather than the precise timing of polychromatic normoblasts entering the circulation. Apoptosis of various stages of erythrocyte development might occur, but it is not the primary determinant of when maturing

3. The laboratory purchases reagents from a manufacturer and develops an assay using standard references. What FDA category is this assay?

- A. Cleared
- B. Home-brew
- C. Research use only

D. Analyte-specific reagent

The correct answer is that the assay falls under the "analyte-specific reagent" category. This classification is applied when a laboratory develops an assay utilizing reagents manufactured for that specific purpose. Analyte-specific reagents are defined as those intended for use in detecting or measuring a particular analyte, which typically includes components like antibodies or nucleic acids for specific biomarkers. In this case, the laboratory is using reagents purchased from a manufacturer and standard references to create an assay. Such development implies that the reagents are being used specifically for testing a defined analyte rather than as part of a manufactured kit or device that has gone through the full regulatory clearance processes. This distinguishes the assay from the cleared category, which refers to tests that have undergone the FDA's 510(k) premarket notification process, demonstrating that they are substantially equivalent to an existing FDA-cleared assay. Home-brew assays, on the other hand, are typically referred to tests developed and used entirely within a laboratory setting, without the use of specific analytes or commercial reagents meant for that purpose. Lastly, "research use only" indicates reagents or assays that are not intended for diagnostic use, further differentiating from the context of this question where the laboratory is

4. What large cells with multiple nuclei are noted in bone marrow core biopsy close to the endosteum?

- A. Megakaryocytes
- B. Osteoclasts**
- C. Adipocytes
- D. Fibroblasts

The presence of large cells with multiple nuclei in bone marrow core biopsy near the endosteum can be attributed to osteoclasts. Osteoclasts are specialized multinucleated cells that derive from monocyte/macrophage lineage and play a crucial role in bone resorption. Their characteristic multiple nuclei result from the fusion of precursor cells, making them distinguishable in histological examinations. These cells are typically found in close proximity to the bone surface, including the endosteal surface, where they are involved in the breakdown of bone tissue. This process is vital for normal bone remodeling and maintaining calcium homeostasis in the body. The identification of these multinucleated cells can aid in understanding various bone diseases, including conditions resulting in increased bone resorption, like osteoporosis. In contrast, megakaryocytes are large cells responsible for platelet production, but they are not multinucleated in the same context and location as osteoclasts. Adipocytes are fat cells and are usually not multinucleated, while fibroblasts are involved in connective tissue formation and repair, also lacking the multinucleated characteristic seen in osteoclasts. Therefore, the identification of osteoclasts aligns correctly with the question's criteria.

5. Which cell stage is responsible for producing mature erythrocytes?

- A. Pronormoblast
- B. Polychromatophilic normoblast
- C. Orthochromic normoblast**
- D. Myeloblast

The cell stage responsible for producing mature erythrocytes is the orthochromic normoblast. During erythropoiesis, the development of red blood cells progresses through several stages, starting from the hematopoietic stem cells and advancing through various progenitor and precursor cells. In the case of the orthochromic normoblast, this stage is characterized by a small cell size, dense nucleus, and the presence of a substantial amount of hemoglobin. As hemoglobin synthesis peaks in this stage, the cell prepares for enucleation, which is a crucial step in the formation of mature red blood cells. After the stage of the orthochromic normoblast, the cell undergoes the process of enucleation to become a reticulocyte and eventually matures into an erythrocyte. This process highlights the significant role of the orthochromic normoblast in the pathway of erythrocyte formation, marking it as the final stage of mitotic activity before the transition to non-nucleated mature red blood cells.

6. In a patient with chronic intestinal bleeding due to aspirin use, what does a ferritin level of 25 ng/mL and a TIBC of 405 mg/dL indicate?

- A. Latent iron deficiency
- B. Functional iron deficiency
- C. Iron deficiency
- D. Equivocal for iron deficiency**

A ferritin level of 25 ng/mL, coupled with a total iron-binding capacity (TIBC) of 405 mg/dL, presents a nuanced picture regarding the patient's iron status. Ferritin is a protein that stores iron and serves as a marker for the body's iron reserves. In this scenario, a ferritin level of 25 ng/mL is on the lower side and may suggest depleted iron stores, but it's important to consider the TIBC as well. A TIBC of 405 mg/dL indicates that the body is producing a high number of transferrin molecules, which bind to iron. Typically, in iron deficiency, both ferritin levels would be low and TIBC would be elevated. However, in this case, the ferritin is low but not critically so, and the increase in TIBC can lead to ambiguity. Since ferritin levels may not just reflect iron deficiency, particularly in the context of other conditions (like inflammation or chronic disease), this measurement can be equivocal in distinguishing whether a patient is in an early stage of iron deficiency or facing another issue affecting iron metabolism. Given the chronic intestinal bleeding from aspirin use, the potential presence of inflammatory processes could further complicate the interpretation. Therefore, the

7. If undiluted spinal fluid shows a total of 105 RBCs counted, what is the concentration of RBCs per mL in a total volume counted?

- A. 131
- B. 263
- C. 1050
- D. 5830

To find the concentration of red blood cells (RBCs) per mL in the spinal fluid, it's essential to understand that the total count of RBCs, which is 105 in this instance, is based on a specific volume of fluid analyzed. When analyzing spinal fluid for the concentration of RBCs, it is common to assess a standardized volume, typically 1 mL or similar. If the total count is 105 RBCs and this count is derived from a 1 mL sample, the concentration would indeed be 105 RBCs/mL. However, if a different volume was used for counting, such as a diluted sample or a volume other than 1 mL, the calculation would change. The correct answer of 131 RBCs/mL suggests that there was likely a volumetric adjustment made or a specific dilution factor applied if the counting was based on a volume greater than 1 mL or was not perfectly measured. If the analysis indeed involved a volume where the 105 total RBCs counted correlates to a larger estimated calculation—for instance, accounting for a particular dilution or misinterpretation of measurement—it could lead to an adjustment resulting in the concentration stated. In scenarios like this, accurate volume measurement is crucial.

8. What type of anemia is associated with low reticulocyte count?

- A. Hemolytic anemia
- B. Microcytic anemia
- C. Aplastic anemia
- D. Megaloblastic anemia

Aplastic anemia is characterized by a high degree of marrow failure leading to a decreased production of red blood cells, white blood cells, and platelets. Reticulocytes are immature red blood cells that are produced in response to anemia. In cases of aplastic anemia, the bone marrow is unable to produce sufficient red blood cells, which results in a low reticulocyte count. This is because there is an inadequate stimulus for the marrow to release reticulocytes into the circulation. In contrast, hemolytic anemia typically presents with a high reticulocyte count as the body responds to the increased destruction of red blood cells by producing more new red blood cells. Microcytic and megaloblastic anemias can also involve low reticulocyte counts, but they are generally linked to other underlying factors such as nutrient deficiencies or chronic disease. In aplastic anemia, the primary issue is a failure of erythropoiesis due to the inability of the marrow to produce enough cells, making it distinctly associated with low reticulocyte levels.

9. When performing a receiver operating curve analysis, what parameter assesses the overall efficacy of an assay?

- A. Area under the curve**
- B. Performance limit (threshold)
- C. Positive predictive value
- D. Negative predictive value

The area under the curve (AUC) is a critical parameter in receiver operating characteristic (ROC) analysis as it quantifies the overall efficacy of an assay or model in distinguishing between two classes, typically positive and negative cases. The AUC provides a single scalar value that encapsulates the trade-off between sensitivity (true positive rate) and specificity (true negative rate) across all possible thresholds. A perfect test has an AUC of 1.0, indicating it can accurately classify all cases correctly. An AUC of 0.5 suggests that the test performs no better than chance. Therefore, the AUC serves as a comprehensive measure, enabling comparisons of different assays or models, making it a pivotal parameter in the evaluation of diagnostic tests. While parameters such as performance limit, positive predictive value, and negative predictive value provide important information regarding a test's predictive capabilities at specific thresholds, they do not capture the overall diagnostic efficacy across all thresholds in the manner that AUC does. This characteristic makes the area under the curve indispensable for assessing the overall performance of assays in ROC analysis.

10. The crystals identified in a cloudy straw-colored fluid from a patient's big toe that appeared needle-shaped are:

- A. Cholesterol
- B. Hyaluronidase
- C. Monosodium urate**
- D. Calcium pyrophosphate

The identification of needle-shaped crystals in a cloudy straw-colored fluid from a patient's big toe points to monosodium urate crystals, which are typically associated with gout. Gout is a form of inflammatory arthritis characterized by the accumulation of uric acid in the joints. When uric acid levels in the body increase, it can lead to the formation of monosodium urate crystals that precipitate in synovial fluid, particularly during a gout attack. These crystals are often observed under polarized light microscopy, appearing as needle-shaped and exhibiting favorable birefringence. Cholesterol crystals tend to form in conditions such as cholesterol embolization or certain types of joint disease but usually appear as flat, rectangular or rhomboid shapes rather than needles. Hyaluronidase is an enzyme that breaks down hyaluronic acid but does not form crystals. Calcium pyrophosphate crystals, on the other hand, are associated with pseudogout and are typically rhomboid-shaped rather than needle-like. The characteristics of the crystals found in this scenario align specifically with monosodium urate, thus making it the correct identification.

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://rodakshematology.examzify.com>

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

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