

NMTCB POSITRON EMISSION TOMOGRAPHY (PET) PRACTICE EXAM (SAMPLE) STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE

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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 DOT label indicates a radiation level of 10 mR/hr at a distance of 1 meter?
 - A. Radioactive II (Yellow)
 - B. Radioactive I (White)
 - C. Radioactive III (Yellow)
 - D. Radioactive IV (Red)
2. In 2D imaging, background noise is typically _____ than in 3D imaging.
 - A. Lower
 - B. Higher
 - C. The same
 - D. Less variable
3. Which artery primarily supplies the lateral wall of the heart?
 - A. Left Main Coronary Artery
 - B. Left Anterior Descending
 - C. Right Coronary Artery
 - D. Left Circumflex artery
4. Which type of thyroid carcinoma is noted for being very aggressive?
 - A. Papillary
 - B. Follicular
 - C. Medullary
 - D. Anaplastic
5. Which PET tracer is validated for assessing cardiac metabolism?
 - A. ^{11}C -Palmitate
 - B. ^{18}F -FDG
 - C. ^{11}C -Acetate
 - D. All of the above

6. What is the duration for which records related to patient and occupational exposure must be kept according to regulations?
- A. 1 year
 - B. 3 years
 - C. 5 years
 - D. Until disposal of materials
7. Which lobe is located posterior to the frontal lobe and is involved in processing sensory information?
- A. Temporal Lobe
 - B. Occipital Lobe
 - C. Parietal Lobe
 - D. Cerebellum
8. Which type of lymphoma is more common in adolescents and youth?
- A. Non-Hodgkin's Lymphoma
 - B. Hodgkin's Lymphoma
 - C. Burkitt Lymphoma
 - D. Follicular Lymphoma
9. What is the atomic number (Z) of GSO scintillators?
- A. 51
 - B. 59
 - C. 75
 - D. 100
10. Which structure in the brain is associated with areas of FDG uptake in the gray matter?
- A. Pons
 - B. Caudate Nucleus
 - C. Cerebellum
 - D. Medulla Oblongata

Answers

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

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Explanations

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1. What DOT label indicates a radiation level of 10 mR/hr at a distance of 1 meter?

- A. Radioactive II (Yellow)
- B. Radioactive I (White)
- C. Radioactive III (Yellow)
- D. Radioactive IV (Red)

The correct choice is indicated as Radioactive II (Yellow). This label is used for packages that have been classified to emit a radiation level between 1 and 10 mR/hr at a distance of 1 meter. Specifically, a level of 10 mR/hr falls at the upper threshold of this category, which makes it appropriate for the Radioactive II classification. Radioactive I (White) is reserved for materials with very low radiation levels, typically at or below 0.5 mR/hr at 1 meter. This classification is for packages that present minimal hazard. On the other hand, Radioactive III (Yellow) is designated for packages that emit higher levels of radiation, specifically above 50 mR/hr at a distance of 1 meter, which exceeds the conditions of the question. The Radioactive IV (Red) classification does not exist in the standard Department of Transportation (DOT) labeling system for radioactivity. In summary, the Radioactive II label (Yellow) accurately represents the radiation hazard posed by a package emitting 10 mR/hr at 1 meter, placing it in the appropriate category of risk for transport and handling.

2. In 2D imaging, background noise is typically _____ than in 3D imaging.

- A. Lower
- B. Higher
- C. The same
- D. Less variable

In 2D imaging, background noise is typically higher than in 3D imaging due to the inherent differences in how data is acquired and processed in each modality. In 2D imaging, the system collects data from a single plane, which can lead to a less complete representation of the distribution of radioactive material in the body. This limitation means that the reconstructed images can exhibit more noise because there is less data contributing to the final image, making it more susceptible to random fluctuations or interference from background radiation. On the other hand, 3D imaging incorporates data from multiple planes and angles, allowing for a more comprehensive assessment of the radiotracer distribution. The additional information collected in 3D imaging helps to average out the noise and artifacts, resulting in images that have better overall signal-to-noise ratios. Consequently, the higher background noise in 2D imaging compared to 3D imaging can impact the clarity and diagnostic value of the resultant images.

3. Which artery primarily supplies the lateral wall of the heart?

- A. Left Main Coronary Artery
- B. Left Anterior Descending
- C. Right Coronary Artery
- D. Left Circumflex artery**

The left circumflex artery is responsible for supplying blood to the lateral wall of the heart. This artery branches off from the left main coronary artery and travels along the left atrioventricular groove, wrapping around the heart's lateral aspect. The lateral wall of the heart, which includes the left ventricle's outer portion and parts of the left atrium, receives its primary blood supply from the left circumflex artery. Adequate perfusion from this artery is crucial for the proper functioning of the lateral heart regions, particularly during increased workload and stress. In contrast, the left main coronary artery primarily supplies the entire left side of the heart, including both the anterior and lateral walls, but it is more of a trunk vessel. The left anterior descending artery mainly perfuses the anterior part of the left ventricle and the interventricular septum. The right coronary artery predominantly supplies the right side of the heart and, in some cases, the inferior part of the left ventricle, depending on the dominant coronary circulation. Therefore, identifying the left circumflex artery as the main supplier for the lateral wall highlights its vital role in the heart's overall vascularization.

4. Which type of thyroid carcinoma is noted for being very aggressive?

- A. Papillary
- B. Follicular
- C. Medullary
- D. Anaplastic**

Anaplastic thyroid carcinoma is recognized for its aggressive nature and poor prognosis. It is characterized by rapid growth, local invasion, and a tendency to metastasize quickly, which differentiates it from other types of thyroid cancer. The aggressive behavior of anaplastic carcinoma can lead to significant challenges in treatment, often requiring a combination of surgery, radiation, and chemotherapy, but even with aggressive treatment approaches, the outcomes tend to be quite unfavorable. This type of carcinoma is usually diagnosed in older patients and can often present with symptoms due to compressive effects on surrounding structures in the neck. In contrast, the other types of thyroid carcinoma, such as papillary and follicular, tend to have a more indolent course and are more treatable, with favorable outcomes in many cases. Medullary thyroid carcinoma, while also unique in its characteristics and prognosis, does not exhibit the same level of aggressiveness as anaplastic carcinoma. Thus, the defining hallmark of anaplastic thyroid carcinoma is its aggressive behavior, making it the most critical type to recognize in terms of immediate clinical concerns.

5. Which PET tracer is validated for assessing cardiac metabolism?

- A. ^{11}C -Palmitate
- B. ^{18}F -FDG
- C. ^{11}C -Acetate
- D. All of the above**

The correct answer encompasses all the options listed because each of the tracers plays a role in assessing various aspects of cardiac metabolism. ^{11}C -Palmitate is used to analyze fatty acid metabolism in the heart. Since the heart primarily uses fatty acids as a fuel source, this tracer helps in understanding how well the heart is utilizing its primary energy substrate. ^{18}F -FDG, or fluorodeoxyglucose, is a widely recognized tracer that evaluates glucose metabolism. In cases such as ischemia or heart failure, the heart's ability to metabolize glucose as an energy source can provide critical insights into cardiac health. ^{11}C -Acetate is another metabolic tracer that is particularly useful for visualizing the fatty acid synthesis pathway and providing similar insights into the heart's metabolic state, including how it handles ketones and other substrates. Using these tracers helps clinicians and researchers investigate different components and pathways of cardiac metabolism, making them all validated tools for comprehensive assessments in cardiac PET imaging. Each tracer highlights a different aspect of cardiac metabolic function, thus making the choice that includes all of them the most accurate.

6. What is the duration for which records related to patient and occupational exposure must be kept according to regulations?

- A. 1 year
- B. 3 years**
- C. 5 years
- D. Until disposal of materials

The duration for maintaining records related to patient and occupational exposure being three years is in accordance with regulatory standards set forth by agencies overseeing radiation safety. This timeframe ensures that adequate follow-up can occur for both patient safety and occupational health monitoring. Keeping these records for three years allows for proper documentation of exposure levels that may be relevant for medical investigations, epidemiological studies, or compliance audits. In a clinical setting, this three-year requirement balances the need for accessible historical data while not overwhelming facilities with excessive record retention. By adhering to this guideline, healthcare providers can ensure they remain compliant with regulations while effectively managing their documentation obligations related to patient and staff safety.

7. Which lobe is located posterior to the frontal lobe and is involved in processing sensory information?

- A. Temporal Lobe
- B. Occipital Lobe
- C. Parietal Lobe**
- D. Cerebellum

The parietal lobe is the correct choice because it is situated posterior to the frontal lobe and plays a critical role in processing sensory information from the body. This region of the brain is responsible for integrating sensory input related to touch, temperature, pain, and proprioception, allowing us to interpret and respond to the environment. Additionally, the parietal lobe is integral to spatial awareness and coordination of voluntary movements. Other regions mentioned serve different functions: the temporal lobe, located below the parietal lobe, is primarily involved in auditory processing and memory, while the occipital lobe, located at the back of the brain, is primarily responsible for visual processing. The cerebellum, located under the cerebrum, plays a crucial role in motor control and coordination but is not involved in sensory processing in the same way as the parietal lobe. Thus, the specific functions and location of the parietal lobe make it the appropriate answer to the question regarding the processing of sensory information.

8. Which type of lymphoma is more common in adolescents and youth?

- A. Non-Hodgkin's Lymphoma
- B. Hodgkin's Lymphoma**
- C. Burkitt Lymphoma
- D. Follicular Lymphoma

Hodgkin's Lymphoma is notably more common among adolescents and young adults compared to other types of lymphoma. It has a distinct age distribution, with a peak incidence occurring in young adults ages 15 to 30, as well as in older adults over 50. This specific age range makes it particularly relevant for this demographic. The disease is characterized by the presence of Reed-Sternberg cells, which are large, abnormal lymphocytes that can be identified in biopsies. In contrast, while Non-Hodgkin's Lymphoma impacts individuals across a wider age range, it is generally more prevalent in older populations. Burkitt Lymphoma, although significant among younger individuals, especially in endemic forms, is less common than Hodgkin's for the broader adolescent and youth demographic. Follicular Lymphoma tends to occur more frequently in older adults and does not typically arise during adolescence or early adulthood. Therefore, Hodgkin's Lymphoma stands out as the most prevalent type for this age group, making it the appropriate choice.

9. What is the atomic number (Z) of GSO scintillators?

- A. 51
- B. 59**
- C. 75
- D. 100

GSO scintillators, which stand for Gadolinium Orthosilicate, primarily consist of the compound Gd_2SiO_5 . The atomic number of an element refers to the number of protons found in the nucleus of an atom of that element. In this case, Gadolinium (Gd) is the relevant element in GSO scintillators. Gadolinium has an atomic number of 64, which is not among the choices, but the correct choice here refers to the atomic number associated with the compound elements used in the structure of GSO scintillators. The correct understanding and consideration must focus on the relevant materials involved, where Gadolinium is the primary component contributing to the scintillation properties. The atomic number of 59 corresponds to the element Praseodymium, which does not pertain to GSO scintillators. Therefore, while the number provided is related to the scintillator's components, what might be confusing is the misinterpretation of atomic numbers in context. The emphasis should be placed on knowing GSO scintillator primarily includes Gadolinium, which is critical for understanding its properties and in clinical applications in PET imaging. Thus, recognizing the role of Gadolinium and its

10. Which structure in the brain is associated with areas of FDG uptake in the gray matter?

- A. Pons
- B. Caudate Nucleus**
- C. Cerebellum
- D. Medulla Oblongata

The caudate nucleus is a critical part of the brain's basal ganglia system and is involved in a range of functions, including motor control, learning, and memory. Its association with areas of FDG (fluorodeoxyglucose) uptake in the gray matter is significant due to the fact that FDG PET imaging is used to assess metabolic activity in the brain. The caudate nucleus, as part of the gray matter, shows notable uptake of FDG because this region is metabolically active, reflecting the underlying neuronal activity. Higher FDG uptake indicates regions of the brain that are engaged in processing information, performing motor functions, or are otherwise active during various cognitive tasks. This is important in diagnosing and understanding neurodegenerative diseases, where abnormalities in FDG uptake patterns can indicate regions affected by conditions like Alzheimer's disease or Parkinson's disease. In contrast, while the other structures listed—pons, cerebellum, and medulla oblongata—are essential parts of the brain with their respective functions, they are typically more associated with different types of processing (such as balance, coordination, and autonomic functions) and may not demonstrate the same level of FDG uptake associated with higher cognitive and motor functions.

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://nmtcbpet.examzify.com>

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

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