

NBME COMPREHENSIVE BASIC SCIENCE EXAMINATION (CBSE) PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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

<https://nbmecbse.examzify.com>



Copyright © 2026 by Examzify - A Kaluba Technologies Inc. product.

ALL RIGHTS RESERVED.

No part of this book may be reproduced or transferred in any form or by any means, graphic, electronic, or mechanical, including photocopying, recording, web distribution, taping, or by any information storage retrieval system, without the written permission of the author.

Notice: Examzify makes every reasonable effort to obtain accurate, complete, and timely information about this product from reliable sources.

SAMPLE

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

SAMPLE

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

SAMPLE

- 1. Antimetabolites are most active during which phase, making them classically S-phase specific?**
 - A. M phase
 - B. S phase
 - C. G1 phase
 - D. G0 phase

- 2. Neuroblastoma most commonly presents in children younger than which age?**
 - A. <2 years
 - B. 2-5 years
 - C. 5-10 years
 - D. >10 years

- 3. Which disease is commonly linked to Raphe nuclei dysfunction?**
 - A. Alzheimer's disease
 - B. Parkinson's disease
 - C. Major depressive disorder
 - D. Huntington's disease

- 4. Which medication is an example of a proton pump inhibitor?**
 - A. Cimetidine
 - B. Omeprazole
 - C. Ranitidine
 - D. Misoprostol

- 5. S4 gallop is most consistent with which change in left ventricular function?**
 - A. Increased left ventricular compliance
 - B. Decreased left ventricular compliance
 - C. Normal left ventricular compliance
 - D. LV dilation with increased compliance

6. Membranous nephropathy EM finding?

- A. Subepithelial immune complex deposits with spike and dome
- B. Mesangial IgA deposition
- C. Crescent formation
- D. Linear IgG along GBM

7. Recurrent vertigo is most consistent with which condition?

- A. Benign paroxysmal positional vertigo
- B. Menière disease
- C. Labyrinthitis
- D. Acoustic neuroma

8. Amyloidosis hallmark diagnostic finding?

- A. Crescent formation
- B. Apple green birefringence under polarized Congo red staining
- C. Subepithelial spike and dome deposits
- D. Hyaline arteriosclerosis

9. Which drug is a topoisomerase II inhibitor?

- A. Irinotecan
- B. Paclitaxel
- C. Cisplatin
- D. Etoposide

10. The Locus Coeruleus uses which neurotransmitter as its primary signaling molecule?

- A. Norepinephrine
- B. Dopamine
- C. Serotonin
- D. Acetylcholine

Answers

SAMPLE

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

SAMPLE

Explanations

SAMPLE

1. Antimetabolites are most active during which phase, making them classically S-phase specific?

- A. M phase
- B. S phase**
- C. G1 phase
- D. G0 phase

Antimetabolites exert their strongest effects when DNA synthesis is underway, which occurs during the S phase. These drugs mimic normal nucleotide substrates or inhibit enzymes needed to make DNA precursors, so they disrupt DNA replication specifically when cells are actively duplicating their genome. For example, methotrexate and other folate antagonists deplete dTMP and other deoxynucleotides, thymidylate synthase inhibitors like 5-fluorouracil block thymidine production, and cytarabine, a cytidine analog, gets incorporated into DNA during replication. Because these events require active DNA synthesis, cells in S phase are most susceptible, whereas in G0/G1 there is little or no DNA replication to interfere with, and in M phase replication is not occurring, limiting the impact of these agents. Thus, antimetabolites are classically S-phase specific.

2. Neuroblastoma most commonly presents in children younger than which age?

- A. <2 years**
- B. 2-5 years
- C. 5-10 years
- D. >10 years

Neuroblastoma tends to appear very early in life, reflecting its origin from neural crest cells of the sympathetic nervous system. The disease most commonly presents in the first two years of life, with the median age at diagnosis around 18 months. Because the incidence is highest in this very young age group, the most likely presentation is in children younger than two. There are cases in older children, but they're much less common. This age pattern helps explain why the correct answer is under 2 years.

3. Which disease is commonly linked to Raphe nuclei dysfunction?

- A. Alzheimer's disease
- B. Parkinson's disease
- C. Major depressive disorder**
- D. Huntington's disease

Serotonergic neurons in the raphe nuclei are key regulators of mood, emotion, and many homeostatic functions. When signaling from the raphe nuclei is disrupted, mood regulation can falter, which is a central feature of major depressive disorder. This condition is classically linked to reduced serotonergic transmission, and treatments that increase serotonin availability (like selective serotonin reuptake inhibitors) help restore signaling to cortical and limbic areas involved in mood. In contrast, Alzheimer's disease centers on cholinergic loss, Parkinson's disease on dopaminergic neuron loss in the substantia nigra, and Huntington's disease on degeneration within striatal circuits. So the disease most commonly associated with raphe nuclei dysfunction is major depressive disorder.

4. Which medication is an example of a proton pump inhibitor?

- A. Cimetidine
- B. Omeprazole**
- C. Ranitidine
- D. Misoprostol

Proton pump inhibitors block the final step of acid production by irreversibly inhibiting the $H^+/K^+-ATPase$ (the proton pump) on gastric parietal cells, leading to a sustained decrease in gastric acid. Omeprazole exemplifies this class: it's a prodrug activated in the acidic environment of the parietal cell canaliculi and then forms a covalent bond with the pump, stopping proton secretion. Because the pump is irreversibly inactivated, acid production stays low until new pumps are synthesized, giving a lasting effect even though the drug's own plasma presence is brief. This contrasts with H_2 receptor antagonists like cimetidine and ranitidine, which reduce acid by blocking histamine receptors on parietal cells and are less potent. Misoprostol, a prostaglandin analog, protects the mucosa and can reduce injury but doesn't inhibit the proton pump.

5. S4 gallop is most consistent with which change in left ventricular function?

- A. Increased left ventricular compliance
- B. Decreased left ventricular compliance**
- C. Normal left ventricular compliance
- D. LV dilation with increased compliance

S4 gallop comes from the atria forcing blood into a left ventricle that cannot easily accept it. This late diastolic sound is produced when the ventricle is stiff and noncompliant, so atrial contraction has to generate extra pressure to fill a rigid ventricle. That's why S4 is a sign of diastolic dysfunction due to decreased LV compliance. In practical terms, LV hypertrophy from chronic hypertension or aortic stenosis, or infiltrative processes that make the ventricle stiff, lead to a prominent S4. If the ventricle were more compliant or normal in its filling properties, an S4 would not be expected. LV dilation tends to be associated more with systolic dysfunction and can produce different sounds (like an S3) rather than an S4, which is specifically tied to reduced compliance.

6. Membranous nephropathy EM finding?

- A. Subepithelial immune complex deposits with spike and dome**
- B. Mesangial IgA deposition
- C. Crescent formation
- D. Linear IgG along GBM

Membranous nephropathy is marked by immune complex deposition on the outer aspect of the glomerular basement membrane, specifically in the subepithelial space. On electron microscopy you see electron-dense immune complexes beneath the podocytes, and these subepithelial deposits cause the GBM to form "spikes" that project between the deposits, producing the spike-and-dome pattern seen with silver stains. This combination—subepithelial immune complex deposits with the characteristic spike-and-dome appearance—is the hallmark EM finding. Other patterns fit different diseases: mesangial IgA deposition points to IgA nephropathy, crescent formation to rapidly progressive GN, and linear IgG along the GBM to anti-GBM disease.

7. Recurrent vertigo is most consistent with which condition?

- A. Benign paroxysmal positional vertigo
- B. Menière disease**
- C. Labyrinthitis
- D. Acoustic neuroma

Recurrent vertigo points to episodic disturbances of inner ear function that come and go over time, with each attack producing spinning sensation and then resolving. The pattern that fits best here is Menière disease. In this condition, abnormal fluid (endolymphatic hydrops) in the inner ear leads to repeated vertigo attacks that can last from about 20 minutes to several hours. These episodes often accompany fluctuating low-frequency hearing loss and tinnitus, and patients may feel a sense of ear fullness between or during episodes. This combination of recurring vertigo with fluctuating sensorineural hearing loss helps distinguish it from other causes. Benign paroxysmal positional vertigo tends to cause very brief vertigo episodes—seconds to a minute—triggered by specific head movements, not truly prolonged recurrent attacks. Labyrinthitis typically starts acutely with a single, prominent episode that lasts days and is usually accompanied by marked hearing loss on the affected side. Acoustic neuroma presents with gradual, progressive hearing loss and imbalance rather than discrete recurrent vertigo attacks.

8. Amyloidosis hallmark diagnostic finding?

- A. Crescent formation
- B. Apple green birefringence under polarized Congo red staining**
- C. Subepithelial spike and dome deposits
- D. Hyaline arteriosclerosis

Amyloidosis is defined by extracellular deposits of misfolded proteins that adopt a beta-pleated sheet structure. The classic diagnostic test is tissue staining with Congo red; under polarized light, these amyloid deposits exhibit an apple-green birefringence. This distinctive color shift arises from the way Congo red binds to the aligned beta-pleated sheet fibrils. Biopsy demonstrating this Congo red positivity with apple-green birefringence is the hallmark confirming amyloid deposition, with typing often done by immunohistochemistry or mass spectrometry. The other findings point to different conditions—crescent formation occurs in rapidly progressive glomerulonephritis, subepithelial spike and dome deposits are seen in membranous nephropathy, and hyaline arteriosclerosis is associated with long-standing hypertension or diabetes—not with amyloid.

9. Which drug is a topoisomerase II inhibitor?

- A. Irinotecan
- B. Paclitaxel
- C. Cisplatin
- D. Etoposide**

The concept being tested is how different cancer drugs target DNA topology and cell division. Etoposide specifically inhibits topoisomerase II by stabilizing the enzyme-DNA cleavable complex, which prevents re-ligation after the DNA is cut. This leads to double-strand breaks and cell death, especially during replication. This mechanism is distinct from the others listed: irinotecan inhibits topoisomerase I, causing single-strand breaks; paclitaxel stabilizes microtubules and blocks mitosis; cisplatin forms DNA crosslinks that hinder replication. Because of its direct inhibition of topoisomerase II and induction of double-strand breaks, etoposide is the correct choice.

10. The Locus Coeruleus uses which neurotransmitter as its primary signaling molecule?

A. Norepinephrine

B. Dopamine

C. Serotonin

D. Acetylcholine

Norepinephrine is the primary signaling molecule of the locus coeruleus. This small brainstem nucleus sends widespread projections throughout the cortex, limbic system, and spinal cord, releasing norepinephrine to modulate arousal, attention, and responses to salient stimuli. The locus coeruleus helps set the brain's level of wakefulness and vigilance by enhancing signal processing and reducing background noise, which is why it's so closely tied to alertness and stress responses. Other neurotransmitters listed—dopamine, serotonin, and acetylcholine—are produced mainly in other brain regions (dopamine in the substantia nigra and ventral tegmental area, serotonin in the raphe nuclei, acetylcholine in basal forebrain and brainstem cholinergic groups) and play different roles, not as the primary transmitter of the locus coeruleus.

SAMPLE

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://nbmecbse.examzify.com>

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

SAMPLE