NBEO OCULAR PHYSIOLOGY PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR THE FULL VERSION STUDY GUIDE

https://nbeoocularphysiology.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 16

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.

SAMPLE

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!

SAMPLE

Questions

SAMPLE

1. Goldmann tonometry is based on which law?

A. Bernoulli's law

B. Imbert-Fick law

C. Hooke's law

D. Pascal's law

2. What is the slight negative electrical charge maintained by photoreceptors in the dark?

A. -30 mv

B. -50 mv

C. -70 mv

D. -90 mv

3. What is the effect of caffeine on aqueous humor production?

A. Increases production

B. Decreases production

C. No effect

D. Inhibits secretion

4. What is the primary function of the orbicularis oculi muscle?

A. Eye movement

B. Eyelid closure

C. Vision enhancement

D. Pupil constriction

5. What cranial nerve innervates the stapedius muscle?

A. CN 5

B. CN 7

C. CN 8

D. CN 10

SAMPLE

6. What physiological change occurs when the ciliary muscle contracts during accommodation?

A. Increased zonule tension

B. Lens becomes flatter

C. Increased lens curvature

D. Decreased aqueous humor production

7. What type of cells are the only two retinal cells that produce action potentials during phototransduction?

A. Photoreceptors and Horizontal cells

B. Ganglion cells and Amacrine cells

C. Bipolar cells and Amacrine cells

D. Photoreceptors and Ganglion cells

8. Which factor does NOT contribute to minimizing light scattering from the cornea?

A. Corneal crystallins

B. Ascorbate helps absorb free radicals

C. Precise spacing of the collagen fibers

D. The cornea is highly vascular

9. Which functionality does NOT decrease with age?

A. Aqueous production

B. Ciliary muscle contraction for accommodation

C. Alpha crystallins found within the lens

D. Corneal endothelial cell count

10. What is the consequence of increased intraocular pressure on retinal perfusion?

A. Improved perfusion

B. Decreased perfusion

C. No effect on perfusion

D. Fluctuating perfusion

SAMPLE

Answers

SAMPLE

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

SAMPLE

Explanations

SAMPLE

1. Goldmann tonometry is based on which law?

A. Bernoulli's law

B. Imbert-Fick law

C. Hooke's law

D. Pascal's law

Goldmann tonometry is fundamentally based on the Imbert-Fick law, which relates to the measurement of pressure within a sphere or a similar structure. This law states that the pressure inside a sphere can be determined by the balance of forces acting on it, specifically the relationship between pressure and the curvature of the surface of the sphere. In the context of Goldmann tonometry, it allows for the calculation of intraocular pressure by applying an external force to flatten a known area of the cornea and measuring the force required to do so. This method assumes that the cornea behaves like a thin elastic shell, and the pressure measured reflects the balance between the elastic properties of the cornea and the intraocular pressure. The accuracy of this tonometry method is enhanced because it takes into account the biomechanics of the eye and provides a reliable estimate of intraocular pressure, which is critical for diagnosing conditions such as glaucoma. The other laws mentioned in the choices are not directly applicable to the principles and mechanism behind Goldmann tonometry. Bernoulli's law pertains to fluid dynamics and flow, Hooke's law addresses the relationship between force and deformation in elastic materials, and Pascal's law concerns fluid pressure within a closed system. While these principles may have relevance

2. What is the slight negative electrical charge maintained by photoreceptors in the dark?

A. -30 mv

B. -50 mv

C. -70 mv

D. -90 mv

The slight negative electrical charge maintained by photoreceptors in the dark is typically around -70 mV. This resting membrane potential is due to the permeability of the photoreceptor cell membrane to potassium ions, as well as the activity of ion pumps, particularly the sodium-potassium pump, which helps maintain the ion gradients essential for phototransduction. In the dark, photoreceptors are depolarized relative to their surrounding environment because the channels for sodium ions are open. This depolarization causes the release of neurotransmitters at the synapse with bipolar cells, effectively communicating the state of the photoreceptors to the downstream retinal cells. When light hits the photoreceptors, it causes a cascading biochemical response that closes these sodium channels, leading to hyperpolarization and a decrease in neurotransmitter release. The -70 mV resting potential is therefore crucial for the phototransduction process, which is the conversion of light into electrical signals in the retina. This resting membrane potential is slightly less negative than -90 mV, indicating that while there is a steady state of negative charge, it fluctuates based on the activation of specific ion channels during the phototransduction pathway. A value of -30 mV would suggest a significant depolarization that

SAMPLE

3. What is the effect of caffeine on aqueous humor production?

A. Increases production

B. Decreases production

C. No effect

D. Inhibits secretion

Caffeine has been found to have a significant impact on the production of aqueous humor by the ciliary body within the eye. Specifically, caffeine tends to inhibit the secretion of aqueous humor. This action can be attributed to caffeine's mechanisms as a central nervous system stimulant and its interactions with various adenosine receptors. By affecting adenosine receptors, caffeine can block the actions normally promoted by adenosine, leading to a reduction in the rate of aqueous humor formation. Studies have indicated that the consumption of caffeine may lead to decreased intraocular pressure, which is often related to changes in aqueous humor dynamics. Therefore, the correct response regarding the impact of caffeine on aqueous humor production is that it decreases production. This understanding is essential for grasping the implications of dietary caffeine intake on ocular health and intraocular pressure management.

4. What is the primary function of the orbicularis oculi muscle?

A. Eye movement

B. Eyelid closure

C. Vision enhancement

D. Pupil constriction

The primary function of the orbicularis oculi muscle is eyelid closure. This muscle encircles the eye and is responsible for the voluntary and involuntary closing of the eyelids. It plays a critical role in protecting the eye from environmental factors such as dryness, dust, and bright light, as well as in facilitating the blinking reflex, which helps in maintaining a moist surface on the cornea and spreading tear fluid over the eye. The orbicularis oculi also has a significant role in overall eye expression, contributing to facial expressions related to emotions. Its contraction allows for rapid blinking, which is essential for clearing debris and preventing irritation of the ocular surface. Other functions mentioned, such as eye movement, vision enhancement, and pupil constriction, are carried out by different muscles and structures within the ocular system. Eye movement is primarily the responsibility of the extraocular muscles, vision enhancement relates to the function of the lens and cornea, and pupil constriction is controlled by the iris muscles. Thus, eyelid closure is distinctly linked to the orbicularis oculi muscle and is its main function.

5. What cranial nerve innervates the stapedius muscle?

A. CN 5

B. CN 7

C. CN 8

D. CN 10

The stapedius muscle, the smallest skeletal muscle in the human body, is primarily responsible for dampening the vibrations of the stapes bone in the middle ear. This action helps to protect the inner ear from loud sounds and contributes to regulating sound transmission. Cranial nerve 7, also known as the facial nerve, innervates the stapedius muscle. This innervation is critical because, when the stapedius muscle contracts, it pulls the stapes away from the oval window of the cochlea, reducing the intensity of sound that enters the inner ear. This function is especially important in preventing damage to the sensory cells in the cochlea from excessive acoustic stimulation. Consequently, the proper functioning of the facial nerve and the stapedius muscle is essential for maintaining auditory health and protecting hearing mechanisms. The association of the stapedius muscle with cranial nerve 7 reflects the nerve's broader role in motor control of facial expression and other functions.

SAMPLE

6. What physiological change occurs when the ciliary muscle contracts during accommodation?

A. Increased zonule tension

B. Lens becomes flatter

C. Increased lens curvature

D. Decreased aqueous humor production

When the ciliary muscle contracts during accommodation, the physiological change that occurs is an increase in lens curvature. This process is essential for near vision. The ciliary muscle is a part of the eye's ciliary body, and its contraction reduces tension on the zonules (suspensory ligaments) that hold the lens in place. As the tension on the zonules decreases, the lens becomes more rounded or convex due to its intrinsic elasticity. This increased curvature allows the lens to refract light more sharply, facilitating clear vision at closer distances. Understanding the mechanics of accommodation emphasizes the relationship between ciliary muscle contraction, zonular tension, and lens shape. This is fundamental to understanding how the eye adjusts focus for different viewing distances, reflecting the dynamic nature of the visual system.

7. What type of cells are the only two retinal cells that produce action potentials during phototransduction?

A. Photoreceptors and Horizontal cells

B. Ganglion cells and Amacrine cells

C. Bipolar cells and Amacrine cells

D. Photoreceptors and Ganglion cells

The only retinal cells that produce action potentials during phototransduction are ganglion cells and amacrine cells. Ganglion cells are responsible for transmitting the visual information to the brain via the optic nerve. They generate action potentials in response to the graded potentials they receive from bipolar cells and directly from photoreceptors through synaptic connections. The action potentials created by ganglion cells represent the final output of the retinal processing pathway, encoding visual information for transmission to higher visual centers. Amacrine cells, although primarily known for their role in modulating the signals between bipolar cells and ganglion cells, can also produce action potentials. They integrate and process signals within the retina, influencing the output of ganglion cells. Their role is crucial for adjusting the responses based on the visual context and contributing to various visual functions such as contrast sensitivity and temporal processing. This function contrasts with other retinal cells, such as photoreceptors, which primarily produce graded potentials rather than action potentials. Although they initiate the phototransduction cascade that eventually influences ganglion cell activity, they do not generate action potentials themselves. Hence, the combination of ganglion cells and amacrine cells as the only retinal cells capable of producing action potentials during phototransduction is key to understanding how visual

SAMPLE

8. Which factor does NOT contribute to minimizing light scattering from the cornea?

A. Corneal crystallins

B. Ascorbate helps absorb free radicals

C. Precise spacing of the collagen fibers

D. The cornea is highly vascular

The correct answer identifies that the presence of vascularization in the cornea does not contribute to minimizing light scattering. In fact, the cornea is avascular by design, which is vital for maintaining transparency. An avascular structure allows light to pass through without obstruction, essential for clear vision. Corneal crystallins, as well as the precise spacing of collagen fibers, play significant roles in minimizing light scattering. The crystallins maintain the refractive index necessary for transparency by preventing the formation of light-scattering opacities. The collagen fibers are precisely organized in a regular arrangement, which is crucial for maintaining the clarity of the corneal structure, allowing for effective transmission of light. Ascorbate, while primarily known for its antioxidant properties by absorbing free radicals, can indirectly help maintain corneal transparency. By combating oxidative stress, ascorbate contributes to the health of corneal cells, thus supporting overall corneal clarity. In summary, the cornea's lack of vascularity is fundamental to its transparent quality and minimizes light scattering, making the statement regarding vascularization the one that does not contribute to this crucial characteristic of the cornea.

9. Which functionality does NOT decrease with age?

A. Aqueous production

B. Ciliary muscle contraction for accommodation

C. Alpha crystallins found within the lens

D. Corneal endothelial cell count

The functionality that does not decrease with age is the ciliary muscle contraction for accommodation. While it is true that accommodation becomes less effective in older individuals, the actual ability of the ciliary muscle to contract does not significantly diminish with age. The decrease in accommodation is primarily due to changes in the lens, such as increased stiffness and reduced elasticity, rather than a reduction in the muscular contraction itself. On the other hand, aqueous production tends to decrease with age, which can lead to a higher risk of developing glaucoma. The alpha crystallins in the lens play a crucial role in maintaining lens transparency, but their overall function is also impacted by age-related changes in the lens. Lastly, the corneal endothelial cell count typically decreases with age, leading to a higher likelihood of corneal edema and other complications. Understanding these distinctions is key in the study of ocular physiology and aging processes.

SAMPLE

10. What is the consequence of increased intraocular pressure on retinal perfusion?

A. Improved perfusion

B. Decreased perfusion

C. No effect on perfusion

D. Fluctuating perfusion

Increased intraocular pressure (IOP) can have a significant negative impact on retinal perfusion. The retina receives its blood supply primarily from the central retinal artery and the choroidal circulation, both of which rely on a pressure gradient for adequate perfusion. When IOP rises, the pressure within the eye can exceed the pressure in these blood vessels, leading to a reduction in blood flow to the retina. This decrease in perfusion can result in ischemic conditions, where the retinal tissue is deprived of essential nutrients and oxygen, potentially causing damage to retinal cells and impairing vision. Over time, chronic high IOP can lead to conditions such as glaucoma, where the sustained lack of adequate blood flow can contribute to the degeneration of the optic nerve and irreversible vision loss. The other options suggest either an improvement or no effect on perfusion, which contradicts the well-established physiological understanding that higher IOP hampers blood flow to the retina. Fluctuating perfusion is also not a common direct consequence of increased IOP, as sustained high pressure tends to result in consistently reduced blood flow rather than variability in perfusion.

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://nbeoocularphysiology.examzify.com

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

SAMPLE