Hemispheres 3.0 – Level I Brain Anatomy and Physiology Practice Test (Sample)

Study Guide

Everything you need from our exam experts!

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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

1. **Superior cortical branches of the MCA supply mainly which lobes?**

   A. Frontal and Parietal Lobes

   B. Frontal and Temporal Lobes

   C. Parietal and Temporal Lobes

   D. Frontal Lobe only

2. **What is the potential space between the skull and dura mater that can fill with blood after trauma?**

   A. Subdural space

   B. Epidural space

   C. Dura mater

   D. Arachnoid mater

3. **Which cerebellar region is most associated with coordinating limb movements?**

   A. Flocculonodular lobe

   B. Anterior lobe

   C. Vermis

   D. Posterior lobe

4. **What is the normal intracranial pressure range?**

   A. 0-15 mmHg

   B. -5 to 5 mmHg

   C. 20-25 mmHg

   D. 40-60 mmHg

5. **Which MCA segment courses over the insular area in the lateral sulcus and commonly bifurcates into superior and inferior cortical branches?**

   A. M1

   B. M2

   C. M3

   D. M4

6. Nerve cell bodies that form the thinking part of the brain and spinal cord are called what?

A. White Matter

B. Grey Matter

C. Nerve Cells

D. Neurons

7. Which of the following describes the appearance of normal CSF?

A. Clear

B. Cloudy

C. Yellow

D. Green

8. Which arteries supply the anterior two-thirds of the cerebral hemispheres and some deeper brain structures?

A. Internal Carotid Arteries

B. External Carotid Arteries

C. Vertebral Arteries

D. Basilar Artery

9. Which brain structure is primarily responsible for motor function and is assisted by premotor and sensory cortices, thalamus, cerebellum, and basal ganglia?

A. Primary motor cortex

B. Occipital lobe

C. Visual association area

D. Cerebellum

10. Lenticulostriate arteries branch off which MCA segment?

A. M1

B. M2

C. M3

D. M4

Answers

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

Explanations

1. Superior cortical branches of the MCA supply mainly which lobes?

A. Frontal and Parietal Lobes

B. Frontal and Temporal Lobes

C. Parietal and Temporal Lobes

D. Frontal Lobe only

The part of the MCA that travels along the upper (superior) lateral surface supplies the frontal and parietal lobes. These regions include the primary motor cortex in the frontal lobe and the primary somatosensory cortex in the parietal lobe, both up on the lateral surface. The temporal lobe, by contrast, is mainly fed by the inferior division of the MCA, so the superior branches don't primarily serve it. In short, those superior branches predominantly nourish the frontal and parietal lobes.

2. What is the potential space between the skull and dura mater that can fill with blood after trauma?

A. Subdural space

B. Epidural space

C. Dura mater

D. Arachnoid mater

The space between the skull and the dura mater is the epidural space. It's a potential space that isn't a true cavity under normal conditions, but trauma can create or reveal it as blood accumulates in that area. The most common source is an injury to the middle meningeal artery, and the resulting epidural hematoma fills this space, often expanding rapidly and pressing on brain tissue. This is different from a subdural hematoma, which involves the space between the dura and arachnoid due to torn bridging veins. The dura mater and arachnoid mater are membranes themselves, not spaces that typically fill in this way.

3. Which cerebellar region is most associated with coordinating limb movements?

A. Flocculonodular lobe

B. Anterior lobe

C. Vermis

D. Posterior lobe

Regional specialization in the cerebellum lets it tailor movements: the lateral hemispheres within the posterior lobe receive detailed input from the motor cortex and sensory pathways, and they are the primary site where plans for voluntary limb movements are refined and coordinated. This region compares the intended trajectory with actual performance and sends corrective signals to the motor systems to smooth out movements, producing coordinated, precise limb actions. If this area is involved, you'd see challenges in coordinating fine, skilled movements of the arms and legs, known as limb ataxia or dysmetria, highlighting its role in distal limb coordination. In contrast, the flocculonodular lobe handles balance and eye movements, and the vermis and anterior lobe mainly govern axial stability and proximal control. Thus, the posterior lobe is the part most closely linked to coordinating limb movements.

4. What is the normal intracranial pressure range?

A. 0-15 mmHg

B. -5 to 5 mmHg

C. 20-25 mmHg

D. 40-60 mmHg

Intracranial pressure is the pressure inside the skull that must be kept within a narrow range to ensure adequate blood flow to the brain. In healthy adults, this pressure is typically about 0 to 15 mmHg. Values within this range help maintain stable cerebral perfusion pressure, which is the driving force for brain blood flow. If ICP stays low (near zero) it isn't physiologically problematic in itself, but pressures that rise above the normal range reduce the available pressure to push blood through the brain (CPP = MAP − ICP). When ICP climbs above roughly 20–25 mmHg, cerebral perfusion can be compromised, increasing the risk of brain ischemia and herniation. Very high pressures, like 40–60 mmHg, are dangerous and signify a severe intracranial process. Other options reflect pressures that aren't physiologically normal: negative pressures aren't typical inside the skull, and those higher values indicate intracranial hypertension.

5. Which MCA segment courses over the insular area in the lateral sulcus and commonly bifurcates into superior and inferior cortical branches?

A. M1

B. M2

C. M3

D. M4

The important idea is that after entering the Sylvian fissure, the middle cerebral artery becomes an insular segment that runs right over the insular cortex within the lateral sulcus. This part of the artery commonly splits into a superior division and an inferior division, with each tract supplying different areas along the lateral surface of the hemisphere. The superior division tends to feed portions of the frontal and parietal opercular regions, while the inferior division supplies parts of the temporal lobe and the inferior parietal areas. Other MCA segments have different paths (before entering the Sylvian fissure or on the cortical surface beyond), but the insular segment is the one that courses over the insula and commonly bifurcates into the two cortical branches.

6. Nerve cell bodies that form the thinking part of the brain and spinal cord are called what?

A. White Matter

B. Grey Matter

C. Nerve Cells

D. Neurons

In the CNS, gray matter is the region that contains the neuron cell bodies, their dendrites, and synapses, where information processing happens. The color comes from the lack of myelin around these cells, unlike white matter, which is made mainly of myelinated axons that connect different gray matter areas. The thinking portions of the brain and spinal cord—the cerebral cortex and the spinal cord's gray matter regions—are built primarily from these neuron cell bodies, so the tissue is described as gray matter. While nerve cells or neurons refer to the cells themselves, the question asks for the tissue that houses their bodies, which is gray matter.

7. Which of the following describes the appearance of normal CSF?

A. Clear

B. Cloudy

C. Yellow

D. Green

Normal CSF is clear and colorless because it contains very few cells and little protein. This transparent appearance indicates there's no infection, inflammation, or blood breakdown products present. A cloudy appearance would mean more cells or protein, as seen with meningitis or inflammatory processes. Yellow CSF can result from xanthochromia due to bilirubin after a bleed or high protein, and greenish CSF can point to pus or certain infections. So the description of clear CSF best matches normal CSF.

8. Which arteries supply the anterior two-thirds of the cerebral hemispheres and some deeper brain structures?

A. Internal Carotid Arteries

B. External Carotid Arteries

C. Vertebral Arteries

D. Basilar Artery

Blood to the front two-thirds of the cerebrum comes from the internal carotid arteries. They enter the skull and split into the anterior cerebral and middle cerebral arteries, which perfuse the medial and lateral surfaces of the hemispheres and extend blood supply into some deep structures, such as parts of the basal ganglia and internal capsule through perforating branches. The external carotid arteries mainly supply the face and scalp, not brain tissue. The vertebral arteries and the basilar artery belong to the posterior circulation, supplying the brainstem and posterior regions rather than the anterior two-thirds. So the internal carotid arteries are the source that supplies this region.

9. Which brain structure is primarily responsible for motor function and is assisted by premotor and sensory cortices, thalamus, cerebellum, and basal ganglia?

A. Primary motor cortex

B. Occipital lobe

C. Visual association area

D. Cerebellum

Movement initiation and control begin in the primary motor cortex, which is located in the precentral gyrus of the frontal lobe. This area is the main command center for voluntary contraction of skeletal muscles, sending motor signals down the corticospinal and corticobulbar pathways to the spinal cord and brainstem to produce movement. The primary motor cortex doesn't work in isolation; it receives planning and preparation from the premotor cortex and supplementary motor areas, and it uses feedback from the somatosensory cortex to fine-tune force and direction. The thalamus acts as a relay, routing information among these cortical regions and subcortical structures. Subcortical players like the cerebellum and the basal ganglia modulate movement—cerebellum contributing to timing, precision, and coordination, and basal ganglia helping with movement selection and smoothing—so the overall movement is coordinated and refined, but the initiation remains with the primary motor cortex. In contrast, regions like the occipital lobe and visual association areas handle vision, not motor command, while the cerebellum, though essential for coordination, does not serve as the primary initiator of motor signals.

10. Lenticulostriate arteries branch off which MCA segment?

A. M1

B. M2

C. M3

D. M4

Lenticulostriate arteries are small perforating vessels that arise from the proximal, pre-bifurcation portion of the middle cerebral artery. That M1 segment lies before the MCA splits into its cortical branches, and these perforators dive into deep brain structures like the putamen, caudate, and internal capsule. The other segments (M2, M3, M4) are distal cortical branches that travel along the Sylvian fissure and onto the cortex, not the deep perforators. So the lenticulostriate arteries originate from the M1 portion of the MCA.

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://hemispheres3lvl1brainanatomyphysio.examzify.com

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