NLN PAX SCIENCE PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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.

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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!

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Questions

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1. **Darwin's theory of evolution suggests the reason for the differences between species is due to**

   A. Mutation

   B. Genetic drift

   C. Natural selection

   D. Acquired characteristics

2. **In which structure of the female reproductive tract is the human egg fertilized?**

   A. Uterus

   B. Fallopian tube

   C. Vagina

   D. Ovary

3. **Starch and glycogen are polymers of glucose that belong to which category?**

   A. Proteins

   B. Lipids

   C. Nucleic acids

   D. Carbohydrates

4. **Atoms with seven valence electrons are most probably classified as which?**

   A. Metals.

   B. Nonmetals.

   C. Metalloids.

   D. Noble gases.

5. **When two atoms share a pair of electrons, the bond between them is called**

   A. covalent

   B. ionic

   C. electrovalent

   D. metallic

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6. Which of these substances contains a nonpolar covalent bond?

A. NaCl

B. O2

C. HBr

D. NH3

7. The observed mass increase when steel wool burns demonstrates that oxygen from the air is incorporated into the product. Which statement best describes this phenomenon?

A. Mass is created from nothing.

B. Oxygen from the air becomes part of the product, increasing total mass.

C. No reaction occurs.

D. The mass decreased.

8. Substance Y is soluble only in nonpolar solvents and does not conduct electricity in solid or liquid form. Y is most probably

A. An ionic substance

B. A polar substance

C. A nonpolar substance

D. A metallic substance

9. Which process rapidly returns glucose filtered into Bowman's capsule back to the tissue fluid along the proximal tubule?

A. Active transport

B. Facilitated diffusion

C. Osmosis

D. Simple diffusion

10. Which aspect of a simple machine is represented by the ratio work output to work input?

A. Power expended

B. Efficiency

C. Actual mechanical advantage

D. Ideal mechanical advantage

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Answers

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

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Explanations

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1. Darwin's theory of evolution suggests the reason for the differences between species is due to

A. Mutation

B. Genetic drift

C. Natural selection

D. Acquired characteristics

The main idea is that inherited variation in a population leads to differential survival and reproduction, so those traits that help organisms thrive become more common over generations. Natural selection acts on the existing variation, sorting which traits are favored by the environment and accumulating those advantageous traits in the lineage. Over long timescales this process can produce the differences we see between species as they adapt to different habitats or ways of life. Mutation provides the raw material of variation, but it is natural selection that decides which variations increase in frequency. Genetic drift can cause changes as well, especially in small populations, but it is random and not the primary mechanism that explains widespread differences between species. Acquired characteristics aren't inherited through genetic information, so traits learned or developed during an organism's lifetime don't directly produce heritable changes in a population.

2. In which structure of the female reproductive tract is the human egg fertilized?

A. Uterus

B. Fallopian tube

C. Vagina

D. Ovary

Fertilization happens in the fallopian tube, the site where sperm and egg meet after ovulation. After the egg is released from the ovary, fimbriae guide it into the tube, and sperm travel up the reproductive tract to encounter it, typically in the ampulla, the portion of the tube where conditions support fusion of genetic material. The uterus is where a fertilized egg implants and grows, not where fertilization occurs. The vagina is a canal through which sperm travel to reach the uterus, but the actual fertilization event takes place in the fallopian tube. The ovary releases the egg but does not provide the environment for fertilization.

3. Starch and glycogen are polymers of glucose that belong to which category?

A. Proteins

B. Lipids

C. Nucleic acids

D. Carbohydrates

Starch and glycogen are polymers of glucose, so they belong to the carbohydrate family. Carbohydrates are made from sugar units, and when many glucose units join, they form polysaccharides. Starch stores energy in plants, while glycogen stores energy in animals and fungi. These molecules are built from glucose through glycosidic bonds, making them long chains that function primarily as energy reserves. They are not proteins (amino acids), lipids (fatty substances), or nucleic acids (nucleotides), so the correct category is carbohydrates.

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4. Atoms with seven valence electrons are most probably classified as which?

A. Metals.

B. Nonmetals.

C. Metalloids.

D. Noble gases.

Having seven valence electrons means the outermost shell is almost full; the atom will typically gain one electron to reach a stable octet. This tendency to gain electrons and form negative ions is a hallmark of nonmetals, especially the halogens. Metals usually have 1–3 valence electrons and form positive ions, noble gases already have a full octet, and metalloids show mixed properties. So the best classification is nonmetals.

5. When two atoms share a pair of electrons, the bond between them is called

A. covalent

B. ionic

C. electrovalent

D. metallic

Sharing electrons to complete outer electron shells leads to a covalent bond. When two atoms share a pair of electrons, neither atom transfers electrons to the other; instead, the shared electrons spend time around both nuclei, holding the atoms together as a molecule and often helping each atom reach a stable electronic configuration. This contrasts with ionic (electrons are transferred, creating charged ions that attract) and metallic bonding (a "sea" of electrons shared by many atoms in a metal). So, the scenario described—two atoms sharing a pair of electrons—best corresponds to a covalent bond.

6. Which of these substances contains a nonpolar covalent bond?

A. NaCl

B. O_2

C. HBr

D. NH_3

When two atoms have very similar electronegativities, they share electrons almost equally, forming a nonpolar covalent bond. The oxygen molecule is made of two identical oxygen atoms, so the electrons are shared equally and there's no net separation of charge. The molecule has no dipole moment, which is the hallmark of a nonpolar covalent bond. In contrast, sodium chloride is an ionic compound—electrons are transferred from sodium to chlorine, creating charged ions rather than a covalent bond. Hydrogen bromide has a noticeable difference in electronegativity between hydrogen and bromine, giving a polar covalent bond with partial charges. Ammonia has covalent bonds that are also polar, and its shape leads to a net dipole moment. So the substance with a nonpolar covalent bond is the oxygen molecule.

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7. The observed mass increase when steel wool burns demonstrates that oxygen from the air is incorporated into the product. Which statement best describes this phenomenon?

A. Mass is created from nothing.

B. Oxygen from the air becomes part of the product, increasing total mass.

C. No reaction occurs.

D. The mass decreased.

When something burns in air, it reacts with oxygen from the surroundings to form a new compound. The observed mass increase happens because oxygen from the air becomes part of the product, so the product's mass equals the original iron plus the mass of the absorbed oxygen. This shows that the air contributes material to the reaction; mass isn't created from nothing, a reaction does occur, and the total mass increases because it includes the gained oxygen.

8. Substance Y is soluble only in nonpolar solvents and does not conduct electricity in solid or liquid form. Y is most probably

A. An ionic substance

B. A polar substance

C. A nonpolar substance

D. A metallic substance

The key idea here is polarity and the presence of mobile charges. Substances tend to dissolve best in solvents with similar polarity: nonpolar solutes in nonpolar solvents, polar solutes in polar solvents. Also, electrical conductivity requires free charged particles. Since this substance dissolves only in nonpolar solvents, it's likely nonpolar, because nonpolar molecules mix readily with other nonpolar media. The fact that it doesn't conduct electricity in either solid or liquid form means there aren't free ions or delocalized electrons present to carry charge. Ionic compounds would not dissolve in nonpolar solvents, and they conduct electricity when melted or dissolved in water due to free ions. Metallic substances conduct electricity as solids because of a sea of delocalized electrons. Polar covalent substances often don't conduct electricity either, but their solubility pattern points away from polarity and toward nonpolarity in this case. So the description fits a nonpolar substance.

9. Which process rapidly returns glucose filtered into Bowman's capsule back to the tissue fluid along the proximal tubule?

A. Active transport

B. Facilitated diffusion

C. Osmosis

D. Simple diffusion

Glucose reabsorption in the proximal tubule relies on energy to move glucose against its gradient, using a sodium-glucose cotransporter that couples glucose uptake to the Na+ gradient. Sodium pumped out by Na+/K+-ATPase on the basolateral side keeps intracellular Na+ low, so Na+ flows from the tubule lumen into the epithelial cell and drags glucose along with it into the cell. This is secondary active transport—energy from the sodium gradient drives glucose uptake. Inside the cell, glucose exits into tissue fluid via GLUT transporters by facilitated diffusion. That's why active transport best explains rapid return of filtered glucose: it moves against a gradient with help from energy. Facilitated diffusion or simple diffusion wouldn't reclaim glucose efficiently against its gradient, and osmosis is about water movement, not solute transport.

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10. Which aspect of a simple machine is represented by the ratio work output to work input?

A. Power expended

B. Efficiency

C. Actual mechanical advantage

D. Ideal mechanical advantage

The idea being tested is how well a simple machine uses input energy to do useful work. The ratio of work output to work input is efficiency, which shows what fraction of the input energy actually becomes useful work. In real machines, some energy is lost to friction, heat, and other losses, so efficiency is less than 1 (often written as a percentage). For example, if you input 100 joules and obtain 80 joules of useful work, the efficiency is 0.8 or 80%. The other concepts describe different ideas: power expended is about the rate at which work is done, not the energy conversion; actual mechanical advantage compares output force to input force; ideal mechanical advantage is the theoretical force ratio with no losses.

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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://nlnpaxscience.examzify.com

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

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