Newton's Laws of Motion Practice Test (Sample)

Study Guide

Everything you need from our exam experts!

Table of Contents

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. **Which law relates the acceleration of an object to the net force acting on it and its mass?**
   - **A. Newton's Second Law of Motion**
   - **B. Newton's Third Law of Motion**
   - **C. The Law of Inertia**
   - **D. Law of Universal Gravitation**

2. **An object experiences a net force of 6 N to the right and has a mass of 2 kg. What is its acceleration?**
   - **A. 3 m/s^2**
   - **B. 6 m/s^2**
   - **C. 2 m/s^2**
   - **D. 1 m/s^2**

3. **Which law explains why a wagon with more mass requires more force to achieve the same acceleration?**
   - **A. Newton's First Law of Motion**
   - **B. Newton's Second Law of Motion**
   - **C. Newton's Third Law of Motion**
   - **D. Law of Gravity**

4. **In physics, the symbol μ represents what?**
   - **A. friction force**
   - **B. coefficient of friction**
   - **C. mass**
   - **D. velocity**

5. **In a velocity-time graph, if the velocity is constant, are the forces acting on the object balanced or unbalanced?**
   - **A. Unbalanced**
   - **B. Balanced**
   - **C. Cannot be determined**
   - **D. Zero velocity**

6. An object of mass 5 kg experiences no net external force. What is its acceleration?

A. 10 m/s^2

B. 2 m/s^2

C. 0 m/s^2

D. 5 m/s^2

7. An object weighs 8000 N on Earth, using g ≈ 10 m/s^2. What is its mass?

A. 80 kg

B. 800 kg

C. 400 kg

D. 1000 kg

8. A 2 kg object accelerates to the right at 4 m/s^2. What is the net force acting on it?

A. 4 N

B. 12 N

C. 8 N

D. 6 N

9. If the net force on an object is not zero, are the forces balanced?

A. Sometimes

B. No

C. Yes

D. Not enough information

10. Which law states that an object at rest and an object in motion remain in that state unless acted upon by an unbalanced force?

A. Newton's First Law of Motion

B. The Law of Gravity

C. Newton's Third Law of Motion

D. Newton's Second Law of Motion

Answers

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

Explanations

1. Which law relates the acceleration of an object to the net force acting on it and its mass?

A. Newton's Second Law of Motion

B. Newton's Third Law of Motion

C. The Law of Inertia

D. Law of Universal Gravitation

The key idea here is how a net external force causes an object to accelerate, and how that acceleration depends on the object's mass. This is captured by Newton's Second Law of Motion, commonly written as F_net = m a. It tells us that acceleration is directly proportional to the net force and inversely proportional to the mass. So, doubling the net force on the same object doubles its acceleration, while doubling the mass with the same net force halves the acceleration. The direction of the acceleration follows the direction of the net force. This distinguishes it from the other ideas: the law about action and reaction pairs describes forces that come in pairs acting on different objects; the law about inertia states that an object at rest stays at rest and an object in motion stays in motion unless a net external force acts; and the law of universal gravitation explains the gravitational attraction between masses. None of these alone express the direct relationship between net force, mass, and acceleration in the way F_net = m a does.

2. An object experiences a net force of 6 N to the right and has a mass of 2 kg. What is its acceleration?

A. 3 m/s^2

B. 6 m/s^2

C. 2 m/s^2

D. 1 m/s^2

Acceleration comes from Newton's second law: a = F_net / m, and it points in the same direction as the net force. With a net force of 6 N to the right and a mass of 2 kg, the acceleration is a = 6 / 2 = 3 m/s^2. The direction is to the right, so the object accelerates at 3 m/s^2 to the right.

3. Which law explains why a wagon with more mass requires more force to achieve the same acceleration?

A. Newton's First Law of Motion

B. Newton's Second Law of Motion

C. Newton's Third Law of Motion

D. Law of Gravity

The main idea is the relationship between force, mass, and acceleration. Newton's second law says that the net force on an object equals its mass times its acceleration (F = m a). If you want the same acceleration for a wagon, the force must increase in proportion to the mass. So, doubling the wagon's mass means you must double the net force to achieve the same acceleration. This reflects inertia—the bigger the mass, the more resistance to speeding up. The other laws don't describe this exact link: the first law is about continued motion when no net force acts, the third law is about action–reaction pairs, and gravity is a downward force due to mass, not the rule that connects force to mass and acceleration in a neutral, horizontal push.

4. In physics, the symbol μ represents what?

A. friction force

B. coefficient of friction

C. mass

D. velocity

μ represents the coefficient of friction, a dimensionless number that describes how rough the contact between two surfaces is. It links the frictional resistance to the normal force through Ff = μN for sliding motion, and the maximum static friction is Ff,max = μsN before motion begins. Because μ is a property of the surfaces themselves, not a force, mass, or velocity, it changes with different materials or textures. For example, if the normal force is 10 N and μ is 0.3, the frictional force would be about 3 N (in kinetic friction).

5. In a velocity-time graph, if the velocity is constant, are the forces acting on the object balanced or unbalanced?

A. Unbalanced

B. Balanced

C. Cannot be determined

D. Zero velocity

Constant velocity means there is no change in speed or direction, so acceleration is zero. According to Newton's second law, the net force equals mass times acceleration, and with zero acceleration the net force must be zero. That's what it means for forces to be balanced: all forces present cancel each other out so their total is zero, even though individual forces might still act. On a velocity-time graph, a horizontal line indicates velocity is not changing, which is exactly zero acceleration. So the forces must sum to zero. Why the other ideas don't fit: if the forces were unbalanced, there would be a nonzero acceleration and the graph would show a sloped line. The question provides constant velocity, so you can determine the net force is zero; "cannot be determined" isn't right because the graph gives you the needed information. And zero velocity is only one possible special case of constant velocity; a constant, nonzero velocity is still consistent with balanced forces.

6. An object of mass 5 kg experiences no net external force. What is its acceleration?

A. 10 m/s^2

B. 2 m/s^2

C. 0 m/s^2

D. 5 m/s^2

When there is no net external force, the net force F_net is zero. Newton's second law says acceleration a = F_net / m. With F_net = 0, the acceleration becomes 0 / 5 kg = 0 m/s^2. This means the object's velocity doesn't change: if it was at rest, it stays at rest; if it was moving, it continues moving at the same speed and direction. The other listed accelerations would require a nonzero net force, which isn't present here.

7. An object weighs 8000 N on Earth, using g ≈ 10 m/s^2. What is its mass?

A. 80 kg

B. 800 kg

C. 400 kg

D. 1000 kg

Weight is the gravitational force on an object and equals mass times gravity: W = m g. You're given a weight of 8000 N and use g ≈ 10 m/s^2. Solve for mass: m = W / g = 8000 N / 10 m/s^2 = 800 kg. So the object's mass is about 800 kilograms. If you check the other masses, they wouldn't give 8000 N with that gravity: 80 kg would weigh about 800 N, 400 kg about 4000 N, and 1000 kg about 10000 N. Using 9.8 m/s^2 would give m ≈ 8000 / 9.8 ≈ 816 kg, but with the given g, 800 kg is the correct result.

8. A 2 kg object accelerates to the right at 4 m/s^2. What is the net force acting on it?

A. 4 N

B. 12 N

C. 8 N

D. 6 N

Net force equals mass times acceleration, F_net = m a. With a mass of 2 kg accelerating to the right at 4 m/s^2, the net force is 2 × 4 = 8 N, directed to the right. The value 8 N matches the given acceleration and mass; other numbers would require different accelerations for the same mass (for example, 4 N would imply 2 m/s^2, 12 N would imply 6 m/s^2).

9. If the net force on an object is not zero, are the forces balanced?

A. Sometimes

B. No

C. Yes

D. Not enough information

Balanced forces cancel each other out, giving a net force of zero, which means no change in motion. If the net force on an object is not zero, there is an unbalanced force. That imbalance causes the object to accelerate in the direction of the net force, as described by Fnet = ma. So the statement is not true—nonzero net force means the forces are not balanced. For example, pushing a cart with more force than the opposing friction makes the cart speed up in the push direction.

10. Which law states that an object at rest and an object in motion remain in that state unless acted upon by an unbalanced force?

A. Newton's First Law of Motion

B. The Law of Gravity

C. Newton's Third Law of Motion

D. Newton's Second Law of Motion

Inertia is the tendency of an object to resist changes to its motion. An object at rest stays at rest because there's no net external force to start it moving; an object moving in a straight line at constant speed keeps moving that way unless a net external force changes its motion. When the net force acting on an object is zero, its velocity remains constant, which is exactly what this statement describes. This idea is Newton's First Law, often called the Law of Inertia. Think of a hockey puck gliding on a nearly frictionless surface: it would keep going straight at the same speed unless a force—like friction, a collision, or a push—acts on it to slow it down, speed it up, or change its direction. It captures the default behavior of objects: they resist changes to how they are already moving. The other Newton laws describe different ideas. Gravity is a force that can cause acceleration when it acts on an object, rather than simply stating that motion persists without unbalanced forces. The second law links net force to acceleration with the equation F = ma. The third law describes how forces come in action-reaction pairs.

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://newtonslawofmotion.examzify.com

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