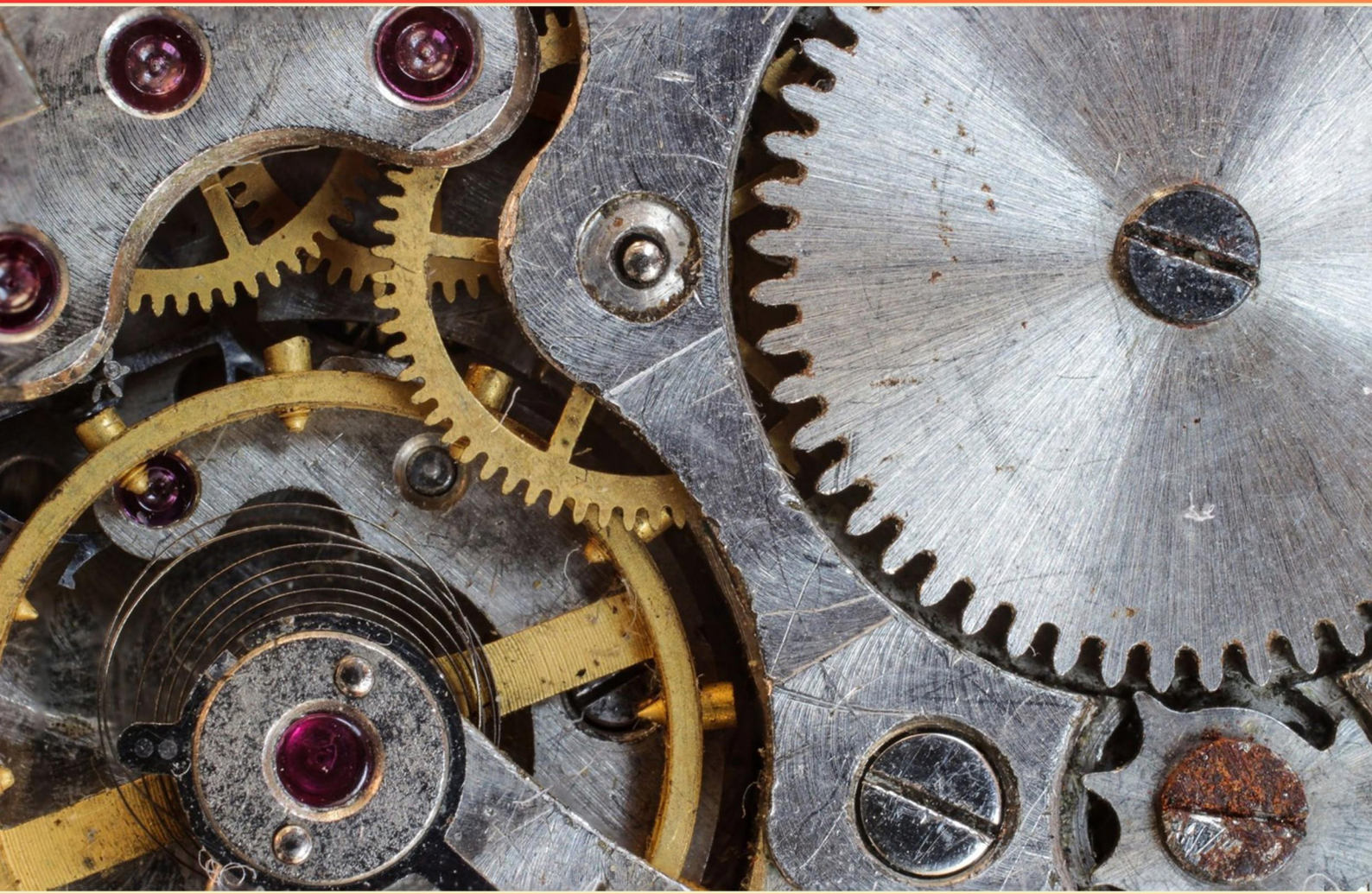


NCEA LEVEL 3 PHYSICS – MECHANICS PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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

<https://ncealvl3physicsmechanics.examzify.com>



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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

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- 1. Vector quantities can be separated into which types of components?**
 - A. Vertical and horizontal components
 - B. Vertical and scalar components
 - C. Horizontal and angular components
 - D. Combined and resultant components
- 2. When an object is subjected to elastic potential energy, what changes occur?**
 - A. The object's shape changes but not its energy content
 - B. The object's energy remains constant throughout its deformation
 - C. The object's shape changes, storing energy to return to its original shape
 - D. The object's mass increases while energy decreases
- 3. What type of force is directed towards the center of a circular path?**
 - A. Deceleration
 - B. Normal force
 - C. Centrifugal force
 - D. Centripetal force
- 4. What kind of movement does not involve any net force?**
 - A. Constant velocity motion
 - B. Accelerated motion
 - C. Decelerated motion
 - D. Rotational motion
- 5. The motion of an object in a circular path with uniform speed is known as?**
 - A. Uniform circular motion
 - B. Circular acceleration
 - C. Angular motion
 - D. Linear motion

6. What is the rate of change of angular displacement of a rotating body known as?
- A. Angular velocity
 - B. Centripetal force
 - C. Linear velocity
 - D. Acceleration
7. What is the resulting force after all forces have been added using vectors called?
- A. Net force
 - B. Resultant force
 - C. Balanced force
 - D. Unbalanced force
8. Which of the following variables does NOT relate to the ideal gas law?
- A. Temperature
 - B. Pressure
 - C. Density
 - D. Volume
9. How can you calculate the resultant force acting on an object?
- A. By subtracting all individual forces
 - B. By vectorially adding all individual forces
 - C. By averaging all forces acting on the object
 - D. By multiplying all individual forces
10. What does torque measure?
- A. The force that opposes motion
 - B. The force causing linear motion
 - C. The force producing rotation
 - D. The net force on an object

Answers

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

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Explanations

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1. Vector quantities can be separated into which types of components?

- A. Vertical and horizontal components**
- B. Vertical and scalar components
- C. Horizontal and angular components
- D. Combined and resultant components

Vector quantities are often represented in terms of their components to simplify analysis, particularly in mechanics. The correct answer, which identifies vertical and horizontal components, aligns with how vectors are typically resolved in two-dimensional space. When analyzing movement, especially for projectiles or forces acting at angles, separating a vector into its vertical and horizontal components allows for easier calculations. The vertical component represents the influence of gravity and motion upward or downward, while the horizontal component reflects side-to-side motion, unaffected by gravity in ideal scenarios. In practice, this type of separation facilitates the application of trigonometric functions, such as sine and cosine, to relate the angle of the vector to its components. This approach is essential when determining things like range or time of flight in projectile motion. The other options do not accurately represent the method by which vectors are commonly analyzed. The vertical and scalar components choice is incorrect because scalar quantities, which have only magnitude (like speed), cannot be combined with vector quantities that have both magnitude and direction. Similarly, horizontal and angular components do not align with standard vector decomposition techniques, as horizontal components are typically discussed in the context of being in a linear dimension rather than an angular one. Lastly, combined and resultant components do not specify distinct types, as resultant components

2. When an object is subjected to elastic potential energy, what changes occur?

- A. The object's shape changes but not its energy content
- B. The object's energy remains constant throughout its deformation
- C. The object's shape changes, storing energy to return to its original shape**
- D. The object's mass increases while energy decreases

When an object is subjected to elastic potential energy, it undergoes deformation where its shape changes due to the applied force. This deformation is typically within the material's elastic limit, meaning the object will return to its original shape when the force is removed. During this process, energy is stored in the form of elastic potential energy, which represents the work done on the object when it is deformed, such as when stretching a spring or compressing a rubber band. The stored elastic potential energy allows the object to exert a restoring force that will return it to its original shape. This behavior is foundational in understanding how materials behave under stress and strain, and it highlights the connection between mechanical work and energy storage in physical systems. The energy is not lost but rather transformed and stored as elastic potential energy until the object is released. This understanding is essential in various applications, from engineering to material science, where the behavior of materials under elastic deformation must be considered. The other choices do not accurately represent the nature of elastic potential energy and the associated phenomena, as they either misinterpret the nature of energy changes or imply incorrect physical characteristics related to the object's mass.

3. What type of force is directed towards the center of a circular path?

- A. Deceleration
- B. Normal force
- C. Centrifugal force
- D. Centripetal force**

The force that is directed towards the center of a circular path is known as centripetal force. This force is essential for maintaining circular motion and acts perpendicular to the velocity of the object moving in the circle. When an object travels in a circle, it continuously changes direction, and this change in direction requires a net force acting towards the center of the circle, which is the role of the centripetal force. Centripetal force can arise from various sources, such as gravitational force in the case of planets orbiting the sun, tension in a string for an object being swung in a circular motion, or friction for a car turning around a curve. Its magnitude can be calculated using the formula: $F_c = \frac{mv^2}{r}$ where F_c is the centripetal force, m is the mass of the object, v is the linear speed, and r is the radius of the circular path. Understanding centripetal force is crucial in analyzing motion in a circular path, as it helps explain how objects can maintain this motion without flying off tangentially. In the context of the other choices, deceleration refers to the reduction of

4. What kind of movement does not involve any net force?

- A. Constant velocity motion**
- B. Accelerated motion
- C. Decelerated motion
- D. Rotational motion

Movement that maintains a constant velocity does not involve any net force acting on the object. According to Newton's First Law of Motion, an object in motion will remain in motion with a constant velocity unless acted upon by a net external force. This means that if an object is moving at a steady speed in a straight line, it is not experiencing any changes in its state of motion, indicating that the forces acting upon it are balanced. In scenarios involving accelerated or decelerated motion, there are changes in velocity, which implies that a net force must be acting on the object to cause that change. Similarly, rotational motion often involves unbalanced forces or torques that affect the object's angular velocity. Thus, the movement characterized by a constant velocity is distinguished by the absence of a net force.

5. The motion of an object in a circular path with uniform speed is known as?

- A. Uniform circular motion**
- B. Circular acceleration
- C. Angular motion
- D. Linear motion

The concept of motion in a circular path with uniform speed is defined as uniform circular motion. In this type of motion, an object moves along a circular trajectory while maintaining a constant speed. Although the speed is constant, the direction of the velocity vector continuously changes, which means that the object is subject to an acceleration known as centripetal acceleration. This acceleration always points toward the center of the circular path, keeping the object in its circular trajectory. While circular acceleration, angular motion, and linear motion are associated with different aspects of movement, they do not accurately depict the specific scenario of an object traveling in a circular path at a constant speed. Circular acceleration refers to the acceleration experienced by an object in circular motion, while angular motion involves rotation about an axis and can include varying speeds. Linear motion, on the other hand, refers to motion in a straight line. Thus, uniform circular motion is the precise term that describes the motion of an object moving along a circular path at a constant speed.

6. What is the rate of change of angular displacement of a rotating body known as?

- A. Angular velocity**
- B. Centripetal force
- C. Linear velocity
- D. Acceleration

The rate of change of angular displacement of a rotating body is referred to as angular velocity. This term describes how quickly the position of an object changes over time as it rotates around a fixed axis. Angular velocity is typically measured in radians per second or degrees per second, indicating how many radians or degrees the object moves through in one second. In rotational motion, angular displacement represents the angle through which an object has rotated, and when we measure how fast this angle changes, we arrive at angular velocity. It is important in many applications, such as understanding the dynamics of gears, wheels, and various mechanical systems that involve rotation. The other options refer to different physical concepts. Centripetal force relates to the force required to keep an object moving in a circular path, linear velocity refers to the speed of a point moving along a linear path, and acceleration refers to the rate of change of linear velocity. Each of these terms serves a distinct purpose in the study of motion and is not a measure of angular displacement's rate of change.

7. What is the resulting force after all forces have been added using vectors called?

- A. Net force**
- B. Resultant force
- C. Balanced force
- D. Unbalanced force

The resulting force after all forces have been added using vectors is known as the net force. This term refers to the overall force acting on an object when all individual forces, taking both their magnitudes and directions into account, are combined. The net force determines how an object will accelerate according to Newton's second law of motion, $F = ma$, where F represents the net force, m is the mass, and a is the acceleration. Understanding net force is crucial because it helps in analyzing the motion of objects. If the net force on an object is zero, it may either remain at rest or continue moving at a constant velocity, indicating balanced forces. If the net force is non-zero, the object will accelerate in the direction of the net force, indicating unbalanced forces are acting. Other terms like resultant force and balanced or unbalanced forces describe different concepts. The term "resultant force" is often used interchangeably with net force in some contexts, but in this scenario, it is specifically asking for the cumulative effect of all forces, which is appropriately termed the net force.

8. Which of the following variables does NOT relate to the ideal gas law?

- A. Temperature
- B. Pressure
- C. Density**
- D. Volume

The ideal gas law is a fundamental equation in thermodynamics that describes the relationships between pressure, volume, temperature, and the number of moles of an ideal gas. The equation is usually represented as $PV = nRT$, where P is the pressure, V is the volume, n is the number of moles, R is the ideal gas constant, and T is the absolute temperature. In this context, temperature, pressure, and volume are directly included in the equation, representing fundamental characteristics essential to predicting the behavior of an ideal gas. However, density does not explicitly appear in the ideal gas law, although it can be derived from it. Density is defined as mass per unit volume (mass/volume). While it can be related to pressure and temperature for an ideal gas through the equation (density = $(P \cdot M)/(R \cdot T)$, where M is the molar mass), it is not one of the primary variables in the ideal gas law itself. Therefore, density is the variable that does not directly relate to the ideal gas law in the same way that temperature, pressure, and volume do.

9. How can you calculate the resultant force acting on an object?

- A. By subtracting all individual forces
- B. By vectorially adding all individual forces**
- C. By averaging all forces acting on the object
- D. By multiplying all individual forces

The resultant force acting on an object is determined by vectorially adding all individual forces. This method takes into account both the magnitude and direction of each force applied to the object. Forces are vectors, which means they have both size (magnitude) and direction. When multiple forces act on an object, their effects can be combined using vector addition, which is crucial for obtaining the correct resultant force. For example, if two forces are exerted on an object in opposite directions, the resultant force will be the difference between the two forces and will act in the direction of the larger force. If forces are applied at angles to each other, it is essential to break them down into their components along the axes (usually horizontal and vertical) and then add these components separately. This vectorial addition ensures that both size and direction are appropriately considered, yielding an accurate resultant force that indicates how the object will move according to Newton's second law of motion.

10. What does torque measure?

- A. The force that opposes motion
- B. The force causing linear motion
- C. The force producing rotation**
- D. The net force on an object

Torque measures the effectiveness of a force in causing an object to rotate around an axis. It is defined as the product of the force applied and the distance from the point of rotation, often referred to as the lever arm. This rotational effect means that torque is crucial for understanding how forces influence the motion of rotating bodies, such as wheels, gears, and levers. When a force is applied at a distance from an axis of rotation, it attempts to turn the object. The greater the force or the longer the distance from the pivot point, the greater the torque produced, which in turn results in a more significant rotational effect. This concept is essential in various applications, from simple tools like wrenches to complex machinery and vehicles. Understanding torque helps in analyzing situations where rotation is involved, which is not adequately captured by simply looking at net forces or linear motions.

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://ncealvl3physicsmechanics.examzify.com>

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

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