MIAT Physics 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. Speed is defined as which of the following?

A. The rate of motion in a given direction.

B. The total distance traveled over a time interval.

C. The distance an object moves in a given time.

D. The energy required to move the object.

2. Which of the following is not a type of mechanical stress?

A. Shear

B. Torsion

C. Compression

D. Vibration

3. Sound intensity is determined by what?

A. Amplitude of the sound wave

B. Frequency

C. Wavelength

D. Phase

4. A liquid has density 31.2 lb/ft^3; what is its specific gravity given water density 62.4?

A. 0.50

B. 0.49

C. 0.60

D. 0.55

5. A long straight wire carries current I = 5 A. What is the magnetic field at r = 0.1 m? (μ0 = 4π×10^-7 T·m/A)

A. About 1.0×10^-5 T

B. About 1.0×10^-3 T

C. About 1.0×10^-7 T

D. About 1.0×10^-4 T

6. A mass of 0.5 kg moving at 9 m/s collides elastically with a stationary 0.5 kg mass. Compute final velocities.

A. v1 = 9 m/s; v2 = 0 m/s

B. v1 = 0 m/s; v2 = 9 m/s

C. v1 = 4.5 m/s; v2 = 4.5 m/s

D. v1 = -9 m/s; v2 = -9 m/s

7. A material has SG 1.40; what is its density in lb/ft^3?

A. 86.0

B. 87.0

C. 88.0

D. 87.36

8. A 0.5 kg mass moving at 9 m/s has kinetic energy. Choose the correct value.

A. 0 J

B. 5 J

C. 60 J

D. 20.25 J

9. Two resistors 8 Ω and 2 Ω are in series across a 20 V source. What is the current, and the voltage across each resistor?

A. I = 1 A; V8 = 8 V; V2 = 12 V

B. I = 2 A; V8 = 16 V; V2 = 4 V

C. I = 4 A; V8 = 32 V; V2 = -12 V

D. I = 0.5 A; V8 = 4 V; V2 = 16 V

10. A 2 kg mass is raised by 3 m. What is the increase in gravitational potential energy?

A. 58.8 J

B. 58.0 J

C. 59.6 J

D. 60.0 J

Answers

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

Explanations

1. Speed is defined as which of the following?

A. The rate of motion in a given direction.

B. The total distance traveled over a time interval.

C. The distance an object moves in a given time.

D. The energy required to move the object.

Speed is how fast something moves, meaning the distance it covers in a given amount of time. The option that talks about the distance an object moves during a specific time interval expresses that distance per that time, which is exactly the rate of motion. For example, if a car travels 60 kilometers in 1 hour, its speed is 60 km per hour. The other ideas describe direction (velocity), just distance, or energy, which aren't speed.

2. Which of the following is not a type of mechanical stress?

A. Shear

B. Torsion

C. Compression

D. Vibration

Mechanical stress is the internal force per unit area inside a material caused by external loads. Compression shortens the material, shear makes layers slide past each other, and torsion twists the material, producing shear stresses on cross-sections. Vibration is an oscillatory motion, not a specific internal stress state. It can cause stresses to vary over time, but it isn't a type of mechanical stress itself.

3. Sound intensity is determined by what?

A. Amplitude of the sound wave

B. Frequency

C. Wavelength

D. Phase

Sound intensity is the energy crossing a unit area each second. For a traveling sound wave, that energy flow grows with the square of the pressure (or displacement) amplitude. In other words, larger amplitude means more energy per second, so higher intensity. Frequency, wavelength, and phase describe other aspects of the wave—pitch, speed-related relationships, and the wave's position in time or space—but they do not set the energy transfer rate by themselves.

4. A liquid has density 31.2 lb/ft^3; what is its specific gravity given water density 62.4?

A. 0.50

B. 0.49

C. 0.60

D. 0.55

Specific gravity is a unitless ratio that compares a liquid's density to water's density at the same conditions. It is found by dividing the liquid's density by the water density: SG = rho_liquid / rho_water. Here, rho_liquid = 31.2 lb/ft^3 and rho_water = 62.4 lb/ft^3, so SG = 31.2 / 62.4 = 0.5. Since the liquid's density is exactly half of water's, its specific gravity is 0.5. This also shows the liquid is lighter than water.

5. A long straight wire carries current I = 5 A. What is the magnetic field at r = 0.1 m? (μ0 = 4π×10^-7 T·m/A)

A. About 1.0×10^-5 T

B. About 1.0×10^-3 T

C. About 1.0×10^-7 T

D. About 1.0×10^-4 T

The magnetic field around a long straight wire is circular and its magnitude is B = μ0 I / (2π r). Plugging in I = 5 A, r = 0.1 m, and μ0 = 4π×10^-7 T·m/A gives B = (4π×10^-7 × 5) / (2π × 0.1) which simplifies to about 1.0×10^-5 T (that is, 10 μT). The field direction is tangential around the wire, determined by the right-hand rule: if the current points along the wire, curling fingers show the direction of B around it.

6. A mass of 0.5 kg moving at 9 m/s collides elastically with a stationary 0.5 kg mass. Compute final velocities.

A. v1 = 9 m/s; v2 = 0 m/s

B. v1 = 0 m/s; v2 = 9 m/s

C. v1 = 4.5 m/s; v2 = 4.5 m/s

D. v1 = -9 m/s; v2 = -9 m/s

In a one-dimensional elastic collision between two equal masses, they simply swap their velocities. Here one mass is moving at 9 m/s and the other is at rest, so after the collision the moving mass stops and the stationary mass takes on the 9 m/s. You can see this from the conservation laws: momentum before equals momentum after, and kinetic energy before equals kinetic energy after. With both masses equal and the second mass initially at rest, momentum gives v1' + v2' = 9, and energy gives (v1')^2 + (v2')^2 = 81. The only solution that satisfies both is v1' = 0 and v2' = 9. Using the standard elastic-collision formulas also yields v1' = 0 and v2' = 9 when m1 = m2 and v2 = 0. Note that the result 4.5 m/s for both masses would come from a completely inelastic collision where they stick together, not from an elastic collision.

7. A material has SG 1.40; what is its density in lb/ft^3?

A. 86.0

B. 87.0

C. 88.0

D. 87.36

Specific gravity compares a material's density to that of water. In English units, the density of water is 62.4 lb/ft^3, and the material's density is SG times that value. So the density = 1.40 × 62.4 = 87.36 lb/ft^3. Therefore, the material's density is 87.36 lb/ft^3.

8. A 0.5 kg mass moving at 9 m/s has kinetic energy. Choose the correct value.

A. 0 J

B. 5 J

C. 60 J

D. 20.25 J

Kinetic energy is given by KE = 1/2 m v^2. With a mass of 0.5 kg and speed 9 m/s, KE = 1/2 × 0.5 × 9^2 = 0.25 × 81 = 20.25 joules. The joule is kg·m^2/s^2, so this value makes sense for these numbers. The other options don't fit because they would require either zero velocity (0 J) or different combinations of mass and speed that don't match the given values; for this mass, 5 J would come from a much smaller speed, and 60 J would require a substantially larger speed.

9. Two resistors 8 Ω and 2 Ω are in series across a 20 V source. What is the current, and the voltage across each resistor?

A. I = 1 A; V8 = 8 V; V2 = 12 V

B. I = 2 A; V8 = 16 V; V2 = 4 V

C. I = 4 A; V8 = 32 V; V2 = -12 V

D. I = 0.5 A; V8 = 4 V; V2 = 16 V

In a series circuit, the same current flows through every component, and the voltages add up to the total supply with the share of each resistor proportional to its resistance. The total resistance is 8 Ω + 2 Ω = 10 Ω, so the current from a 20 V source is I = 20 V / 10 Ω = 2 A. This current is the same through both resistors. The 8 Ω resistor drops V8 = I × 8 Ω = 2 A × 8 Ω = 16 V, and the 2 Ω resistor drops V2 = I × 2 Ω = 2 A × 2 Ω = 4 V. The voltages add to 16 V + 4 V = 20 V, matching the source. So the current is 2 A, with 16 V across the 8 Ω resistor and 4 V across the 2 Ω resistor.

10. A 2 kg mass is raised by 3 m. What is the increase in gravitational potential energy?

A. 58.8 J

B. 58.0 J

C. 59.6 J

D. 60.0 J

The change in gravitational potential energy when you lift a mass in a uniform gravitational field is ΔU = m g h. Here, m = 2 kg, g ≈ 9.8 m/s^2, and h = 3 m. So ΔU = 2 × 9.8 × 3 = 58.8 J. This matches the given value. Using a slightly different value of g (like 9.81) would give about 58.86 J, still around 58.8–58.9 J; rounding to 60 J would come from using g = 10 m/s^2.

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://miatphysics.examzify.com

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