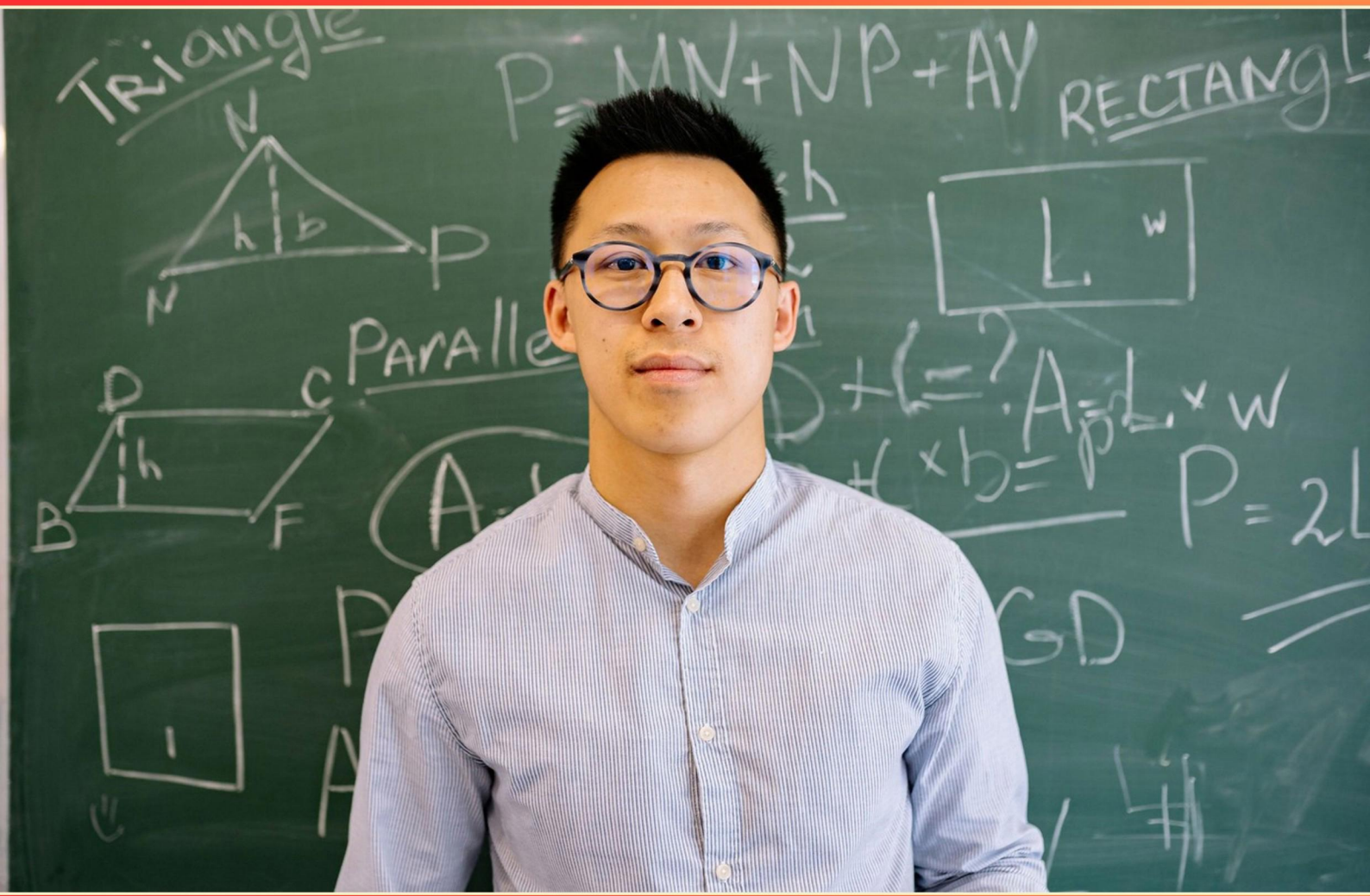
MIAT PHYSICS PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR THE FULL VERSION STUDY GUIDE

https://miatphysics.examzify.com

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. A capacitor with C = 20 μF is charged to V = 10 V. What is the energy stored?

A. 1.0×10^-3 J

B. 1.0×10^-4 J

C. 1.0×10^-2 J

D. 9.0×10^-3 J

2. If one horsepower is applied for one minute, how many foot-pounds of work are produced?

A. 3,300

B. 66,000

C. 33,000

D. 33,000

3. Which unit is used to express work in the English system?

A. Foot-Pounds-Force

B. Pound-Feet

C. Newton-Meters

D. Foot-Pounds

4. How does the refractive index n vary with wavelength in normal dispersion?

A. n increases with wavelength

B. n decreases as wavelength increases

C. n remains constant with wavelength

D. n varies non-monotonically with wavelength

5. What is the speed of sound at standard sea level?

A. 343 m/s

B. 1125 ft/s

C. 768 mph

D. 661.7 knots

6. A 60 W lamp is on for 60 seconds. How much energy is consumed?

A. 1800 J

B. 3600 J

C. 7200 J

D. 0 J

7. What is standard sea level atmospheric pressure?

A. 1 Atmosphere

B. 29.92 Inches of Mercury

C. 1013.25 hPa

D. 5.00 Inches of Mercury

8. What is the vertical component of the initial velocity for the projectile launched at 30 degrees with speed 20 m/s?

A. About 5 m/s

B. About 15 m/s

C. About 20 m/s

D. About 10 m/s

9. A photon with frequency 6.0×10^14 Hz has energy E. What is E in joules and in electronvolts? (h = 6.626×10^-34 J·s; 1 eV = 1.602×10^-19 J)

A. E ≈ 1.50×10^-19 J ≈ 0.94 eV

B. E ≈ 3.98×10^-18 J ≈ 24.8 eV

C. E ≈ 2.99×10^-19 J ≈ 1.86 eV

D. E ≈ 3.98×10^-19 J ≈ 2.48 eV

10. The specific heat capacity of liquid water is about 4.18 kJ/(kg·K). How much energy is needed to raise 1 kg of water by 1°C?

A. 0.418 kJ

B. 4.18 kJ

C. 41.8 kJ

D. 418 kJ

Answers

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

Explanations

1. A capacitor with C = 20 μF is charged to V = 10 V. What is the energy stored?

A. 1.0×10^-3 J

B. 1.0×10^-4 J

C. 1.0×10^-2 J

D. 9.0×10^-3 J

A capacitor stores energy according to E = (1/2) C V^2. Convert the capacitance to farads: 20 μF = 20 × 10^-6 F = 2.0 × 10^-5 F. With V = 10 V, E = 0.5 × (2.0 × 10^-5) × (10)^2 = 0.5 × 2.0 × 10^-5 × 100 = 1.0 × 10^-3 J. So the energy stored is 1.0 × 10^-3 J (1 millijoule).

2. If one horsepower is applied for one minute, how many foot-pounds of work are produced?

A. 3,300

B. 66,000

C. 33,000

D. 33,000

Work is the amount of energy transferred by a force acting over time, and power times time gives work. One horsepower is a rate equal to 550 foot-pounds of work per second. Applying that rate for one minute means 60 seconds of operation, so the total work is 550 × 60 = 33,000 foot-pounds. Therefore, the work produced is 33,000 foot-pounds.

3. Which unit is used to express work in the English system?

A. Foot-Pounds-Force

B. Pound-Feet

C. Newton-Meters

D. Foot-Pounds

Work in the English system is measured as force times distance, so the unit is foot-pounds. When you exert one pound of force over a distance of one foot, you've done one foot-pound of work. The common shorthand for this in English units is Foot-Pounds (often written ft·lbf). Pound-Feet is a unit of torque, not work, so it isn't appropriate here. Newton-Meters belongs to the SI system, not the English system. Foot-Pounds is the best fits because it directly represents energy/work in the English units.

4. How does the refractive index n vary with wavelength in normal dispersion?

A. n increases with wavelength

B. n decreases as wavelength increases

C. n remains constant with wavelength

D. n varies non-monotonically with wavelength

In normal dispersion, the refractive index n decreases as the wavelength of light increases. Shorter wavelengths experience a larger n and thus slow down more in the medium, bending more when entering or exiting the material. Conversely, longer wavelengths have a smaller n, slow down less, and bend less. This is why prisms spread white light into colors: blue light (shorter wavelength) is refracted more than red light (longer wavelength). Near absorption bands, dispersion can behave differently (anomalous dispersion), but in the typical visible range the trend is toward decreasing n with increasing wavelength.

5. What is the speed of sound at standard sea level?

A. 343 m/s

B. 1125 ft/s

C. 768 mph

D. 661.7 knots

Sound travels through air at a speed set by temperature. At standard sea level conditions (about 20°C), that speed is about 343 meters per second. To compare in nautical terms, convert meters per second to knots: 1 m/s is about 1.9438 knots, so 343 m/s is roughly 666–667 knots. The option 661.7 knots is the closest match to that value, which is why it represents the speed of sound at standard sea level. The same speed is also about 767 mph or roughly 1125 ft/s.

6. A 60 W lamp is on for 60 seconds. How much energy is consumed?

A. 1800 J

B. 3600 J

C. 7200 J

D. 0 J

Energy used by an electrical device equals its power times the time it runs. A 60 W lamp delivers 60 joules each second. If it stays on for 60 seconds, the energy is 60 J/s × 60 s = 3600 J. (Since 1 W = 1 J/s, the units check out.) So the lamp consumes 3600 joules of energy in that minute. (That's 3.6 kJ.) The other numbers would come from different times or misreading the units.

7. What is standard sea level atmospheric pressure?

A. 1 Atmosphere

B. 29.92 Inches of Mercury

C. 1013.25 hPa

D. 5.00 Inches of Mercury

Standard sea level pressure is a fixed reference: 1 atmosphere, which equals 1013.25 hPa (101325 Pa) and 760 mmHg. That same pressure expressed in inches of mercury is 29.92 inHg. Among the options, 29.92 inches of mercury is the direct inch-based expression of that standard value, so it best matches the common way this pressure is reported. The other options describe the same pressure in different units (1 atm or 1013.25 hPa) or are far too low (5.00 inHg).

8. What is the vertical component of the initial velocity for the projectile launched at 30 degrees with speed 20 m/s?

A. About 5 m/s

B. About 15 m/s

C. About 20 m/s

D. About 10 m/s

Decomposing the initial velocity into vertical and horizontal parts using trigonometry is what this question tests. The vertical component is found by multiplying the speed by the sine of the launch angle: v0_y = v0 sin(theta). With a speed of 20 m/s and a launch angle of 30°, sin 30° = 1/2, so v0_y = 20 × 1/2 = 10 m/s upward. So the initial vertical speed is about 10 m/s. Other options would require different sine values (for example, 5 m/s would need sin 30° = 0.25, or 20 m/s would mean no tilt), which isn't the case here.

9. A photon with frequency 6.0×10^14 Hz has energy E. What is E in joules and in electronvolts? (h = 6.626×10^-34 J·s; 1 eV = 1.602×10^-19 J)

A. E ≈ 1.50×10^-19 J ≈ 0.94 eV

B. E ≈ 3.98×10^-18 J ≈ 24.8 eV

C. E ≈ 2.99×10^-19 J ≈ 1.86 eV

D. E ≈ 3.98×10^-19 J ≈ 2.48 eV

Energy of a photon is E = h f, so it scales with frequency. Using h = 6.626×10^-34 J·s and f = 6.0×10^14 Hz gives E = (6.626×10^-34)(6.0×10^14) ≈ 3.9756×10^-19 J, about 3.98×10^-19 J. To convert to electronvolts, divide by 1.602×10^-19 J per eV: E ≈ 3.9756×10^-19 / 1.602×10^-19 ≈ 2.48 eV. So the energy is roughly 3.98×10^-19 J and 2.48 eV. The correct choice lists these values, while the others don't match the energy corresponding to this frequency.

10. The specific heat capacity of liquid water is about 4.18 kJ/(kg·K). How much energy is needed to raise 1 kg of water by 1°C?

A. 0.418 kJ

B. 4.18 kJ

C. 41.8 kJ

D. 418 kJ

The question hinges on using the specific heat concept and the energy balance Q = m c ΔT. Specific heat capacity tells us how much energy is needed to raise the temperature of a unit mass by one degree. For water, c ≈ 4.18 kJ/(kg·K). The energy to heat a mass m by a temperature change ΔT is Q = m c ΔT. Here m = 1 kg and ΔT = 1 K (1°C is the same size change as 1 K). So Q = 1 × 4.18 × 1 = 4.18 kJ. Thus, about 4.18 kJ of energy is needed. If either the mass or the temperature change were different, the energy would scale accordingly (e.g., more mass or a larger ΔT requires more energy).

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!