

Njit Physics Common Exam

Phys 102
NJIT

Common Exam 3 - Practice Problems

Common Exam 3, Covers: chapters, 6, 7, 8

Problem 1. A 5.0-kg cart is moving horizontally at 6.0 m/s. In order to increase its speed to 10.0 m/s, the net work done on the cart must be:

- A) 160 J
- B) 400 J
- C) 550 J
- D) 40 J
- E) 90 J

Problem 2. What power is needed to lift a 49-kg person a vertical distance of 5.0 m in 20.0 s?

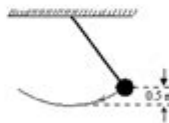
- A) 60 W
- B) 120 W
- C) 210 W
- D) 12.5 W
- E) 25 W

Problem 3. Which one of the following choices is an example of a conservative force?

- A) tension
- B) elastic spring force
- C) static frictional force
- D) motor propulsion force
- E) normal force

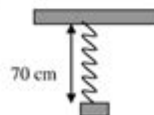
Problem 4. The long pendulum shown is drawn aside until the ball has risen 0.50 m. It is then released from rest. The speed of the ball at its lowest position is:

- A) 20 m/s
- B) 5.8 m/s
- C) 4.2 m/s
- D) 3.1 m/s
- E) cannot be determined unless the mass is known



Problem 5: A 10-kg mass is attached to one end of a 50-cm-long unstretched spring. When the other end of the spring is attached to the ceiling the mass reaches a stable stationary position as shown in the adjacent diagram. What is the spring constant of the spring?

- A) 490 N/m
- B) 245 N/m
- C) 980 N/m
- D) 196 N/m
- E) 140 N/m



1 of 8

NJIT Physics Common Exam is an essential assessment for students enrolled in physics courses at the New Jersey Institute of Technology (NJIT). This exam serves multiple purposes: it evaluates students' understanding of fundamental physics concepts, ensures they are prepared for more advanced studies, and helps instructors gauge the effectiveness of their teaching methods. As physics is a foundational subject for many engineering and science majors, the NJIT Physics Common Exam plays a critical role in shaping students' academic journeys.

Overview of the NJIT Physics Common Exam

The NJIT Physics Common Exam is designed to assess the knowledge and skills

of undergraduate students in physics, particularly those enrolled in introductory courses. The exam covers a broad range of topics and is aligned with the curriculum set by the department.

Objectives of the Exam

The primary objectives of the NJIT Physics Common Exam include:

1. **Assessment of Fundamental Knowledge:** The exam tests students' comprehension of key physics principles, laws, and theories.
2. **Standardization:** By providing a common assessment tool, the exam ensures that all students are evaluated on the same criteria, fostering fairness and consistency in grading.
3. **Feedback for Improvement:** Results from the exam can offer valuable insights to both students and faculty about areas that may require further instruction or emphasis.
4. **Preparation for Advanced Studies:** The exam serves as a benchmark for students to ensure they possess the necessary knowledge base for more advanced physics courses.

Exam Format

The format of the NJIT Physics Common Exam typically consists of:

- **Multiple Choice Questions:** These questions assess students' quick recall and application of fundamental physics concepts.
- **Problem-Solving Questions:** Students must demonstrate their ability to apply physics principles to solve numerical problems.
- **Conceptual Questions:** These questions focus on understanding and interpreting various physics concepts rather than merely applying formulas.

The exam usually lasts for a set duration, often around two hours, and is administered once or twice each academic year.

Topics Covered in the Exam

The NJIT Physics Common Exam encompasses a variety of topics that students encounter in their introductory physics courses. Some of the key areas of focus include:

1. Mechanics

- **Kinematics:** Motion in one and two dimensions, velocity, acceleration, and equations of motion.

- Dynamics: Newton's laws of motion, friction, and circular motion.
- Energy: Work, kinetic energy, potential energy, and conservation of energy.
- Momentum: Conservation of momentum, collisions, and impulse.

2. Thermodynamics

- Laws of Thermodynamics: Understanding the zeroth, first, second, and third laws.
- Heat Transfer: Conduction, convection, and radiation.
- Thermal Properties of Matter: Temperature, heat, and the specific heat capacity.

3. Waves and Oscillations

- Simple Harmonic Motion: Characteristics of oscillatory motion and energy in oscillators.
- Wave Properties: Speed, frequency, wavelength, and the nature of sound waves.
- Interference and Resonance: Concepts of constructive and destructive interference, and resonance phenomena.

4. Electricity and Magnetism

- Electrostatics: Coulomb's law, electric fields, and potential.
- Circuits: Ohm's law, series and parallel circuits, and Kirchhoff's rules.
- Magnetism: Magnetic fields, forces on moving charges, and electromagnetic induction.

Preparation Strategies for the NJIT Physics Common Exam

To perform well on the NJIT Physics Common Exam, students should adopt effective study strategies. Here are some recommended preparation methods:

1. Review Course Materials

- Lecture Notes: Regularly review and summarize lecture notes to reinforce key concepts.
- Textbooks: Read and understand chapters related to the exam topics; make use of diagrams and illustrations for better comprehension.

2. Practice Problem-Solving

- Problem Sets: Complete problem sets provided in class or from textbooks to enhance problem-solving skills.
- Old Exams: Practice with previous years' exam papers to familiarize yourself with the question format and difficulty level.

3. Study Groups

- Collaborate with Peers: Form study groups to discuss challenging concepts and solve problems together. Teaching others can reinforce your understanding.

4. Utilize Online Resources

- Educational Websites: Websites like Khan Academy, Coursera, and MIT OpenCourseWare offer free resources and lectures on physics topics.
- YouTube Channels: Channels dedicated to physics education can provide visual and practical explanations of complex concepts.

Strategies for Taking the Exam

When it comes time to take the NJIT Physics Common Exam, students should have strategies in place to maximize their performance:

1. Time Management

- Allocate Time Wisely: Divide the total exam time among questions, ensuring ample time for challenging sections.
- Prioritize Questions: Start with questions you find easier to build confidence before tackling more complex ones.

2. Read Questions Carefully

- Identify Keywords: Pay attention to keywords and phrases that dictate what is being asked, such as "calculate," "explain," or "compare."
- Check Units: Ensure that units are consistent throughout the problem to avoid calculation errors.

3. Show Work for Problem-Solving

- Detail Steps: Write out all steps clearly when solving problems, as partial credit may be awarded for correct reasoning even if the final answer is incorrect.

4. Review Answers

- If Time Permits: Go back and review answers, checking for any mistakes or miscalculations.

Conclusion

The NJIT Physics Common Exam is a vital component of the academic experience for students pursuing physics at NJIT. It not only evaluates their understanding of essential physics concepts but also serves as a stepping stone toward advanced studies in science and engineering disciplines. By preparing effectively and employing good test-taking strategies, students can maximize their performance on the exam and lay a solid foundation for their future studies in physics and related fields. The knowledge gained and skills developed through this process will undoubtedly serve students well throughout their academic careers and beyond.

Frequently Asked Questions

What is the NJIT Physics Common Exam?

The NJIT Physics Common Exam is a standardized test administered to undergraduate students at New Jersey Institute of Technology to assess their understanding and knowledge of introductory physics concepts.

What topics are covered in the NJIT Physics Common Exam?

The exam typically covers fundamental topics in physics, including mechanics, thermodynamics, electromagnetism, waves, and modern physics.

How is the NJIT Physics Common Exam structured?

The exam usually consists of multiple-choice questions, with a specific number of questions covering various topics in physics, designed to test students' conceptual understanding and problem-solving skills.

When is the NJIT Physics Common Exam administered?

The NJIT Physics Common Exam is generally administered at the end of the semester, usually during the final exam period, but specific dates may vary each academic year.

What resources are available for NJIT students to

prepare for the Physics Common Exam?

Students can utilize various resources, including review sessions, past exam papers, online tutorials, and study groups organized by the physics department to prepare for the exam.

How does the NJIT Physics Common Exam impact a student's grade?

The NJIT Physics Common Exam may contribute to the final grade in physics courses, depending on the instructor's grading policy, often serving as a benchmark for overall performance in the subject.

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Prepare for success with the NJIT Physics Common Exam! Explore tips

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