

# IAC RED SET SCIENCE BEE PRACTICE TEST (SAMPLE)

## STUDY GUIDE



## SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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<https://iacedsetsciencebee.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. What term describes a symbiotic relationship in which two different species both benefit?**
  - A. Mutualism
  - B. Commensalism
  - C. Parasitism
  - D. Predation
- 2. Which tree is the source of quinine, the medication used to treat malaria?**
  - A. Cinchona tree
  - B. Rubber tree
  - C. Cocoa tree
  - D. Birch tree
- 3. Which virus infection of the respiratory tract can trigger an extreme inflammatory response and sepsis?**
  - A. flu
  - B. Cold
  - C. Measles
  - D. RSV
- 4. Which physical quantity's conservation follows from time invariance, with the joule as its SI unit?**
  - A. Momentum
  - B. Energy
  - C. Mass
  - D. Power
- 5. Vesta is an example of which type of object?**
  - A. Asteroid
  - B. Planet
  - C. Dwarf planet
  - D. Comet

6. The OSIRIS-REx mission collected samples from Bennu, which is classified as what type of Solar System object?
- A. Comet
  - B. Asteroid
  - C. Moon
  - D. Planet
7. Which field of study focuses on the origin and evolution of the universe and its large-scale structure?
- A. Astronomy
  - B. Cosmology
  - C. Astrophysics
  - D. Geology
8. The first of these objects to be discovered has been reclassified as a dwarf planet. Which object is it?
- A. Pluto
  - B. Ceres
  - C. Haumea
  - D. Vesta
9. The Atwood machine belongs to the class of machines that includes block and tackle systems. What is this class?
- A. Levers
  - B. Pulley systems
  - C. Inclined planes
  - D. Screws
10. Phages are viruses that infect which type of organism?
- A. Bacteria
  - B. Phages (viruses that infect bacteria)
  - C. Fungi
  - D. Prions

## **Answers**

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

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## **Explanations**

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**1. What term describes a symbiotic relationship in which two different species both benefit?**

- A. Mutualism**
- B. Commensalism
- C. Parasitism
- D. Predation

*When two different species both gain something that helps them survive or reproduce, that relationship is mutualism. This is the hallmark: a win-win in which each partner provides something the other needs—like a bee getting nectar from a flower while helping the flower by transferring pollen, or certain gut microbes helping an animal digest food while receiving a warm, nutrient-rich environment in return. Other familiar examples include algae living inside corals, where the algae share energy from photosynthesis and the coral provides a protected place and nutrients. Why this fits the description best here: the term describes a true two-way benefit. In other kinds of relationships, the benefits aren't shared equally or aren't mutual. Commensalism means one species benefits and the other is largely unaffected. Parasitism means the parasite benefits at the host's expense. Predation describes one organism eating another, which benefits the eater but harms the prey.*

**2. Which tree is the source of quinine, the medication used to treat malaria?**

- A. Cinchona tree**
- B. Rubber tree
- C. Cocoa tree
- D. Birch tree

*Quinine, a bitter alkaloid long used to treat malaria, is derived from the bark of the Cinchona tree. The quinine alkaloids interfere with the malaria parasite's ability to detoxify heme, helping to kill the parasite. This historical bark has earned Cinchona its fame as the source of quinine, long before synthetic antimalarials. The other trees don't produce quinine or similar antimalarial alkaloids—rubber tree yields latex for rubber, cocoa tree yields chocolate, and birch is valued for wood and sap. So the Cinchona tree is the source of quinine.*

**3. Which virus infection of the respiratory tract can trigger an extreme inflammatory response and sepsis?**

- A. flu**
- B. Cold
- C. Measles
- D. RSV

*Some respiratory viral infections can trigger a body-wide inflammatory response that, if uncontrolled, leads to sepsis. The influenza virus is well known for this because in severe cases it can provoke a strong release of inflammatory mediators throughout the body, causing systemic symptoms, organ dysfunction, and even septic shock. It can also pave the way for bacterial pneumonia, which raises the risk of sepsis. By contrast, the common cold virus usually stays in the upper airway with milder symptoms; measles and RSV can be serious but don't typically cause the same pattern of systemic inflammatory response leading to sepsis as a primary outcome. So the influenza virus best fits the idea of triggering extreme inflammation and sepsis.*

**4. Which physical quantity's conservation follows from time invariance, with the joule as its SI unit?**

- A. Momentum
- B. Energy**
- C. Mass
- D. Power

*If the laws of physics don't depend on the moment in time, the total energy of a closed system stays the same. That time-invariance means you can't create or destroy energy just by waiting; instead, energy simply shifts between forms like kinetic, potential, and internal energy without changing the total amount. A classic illustration is a frictionless pendulum: as it swings, kinetic and potential energy trade off, but their sum remains constant. The joule is the SI unit for energy, defined as the work done when a force of one newton acts over a displacement of one meter. This makes joules the natural way to quantify the capacity to do work, which is exactly what energy measures. Other quantities aren't tied to time symmetry in the same way. Momentum conservation arises from spatial translation symmetry, not time, so it's not the conservation law linked to time invariance. Mass is a separate property that can vary in relativistic or particle-physics contexts, not the conserved quantity associated with time. Power is the rate of energy transfer, not a stored quantity that remains constant in time.*

**5. Vesta is an example of which type of object?**

- A. Asteroid**
- B. Planet
- C. Dwarf planet
- D. Comet

*Understanding how objects in the solar system are categorized by what they are and how they behave helps explain Vesta's classification. Vesta is a rocky body located in the asteroid belt between Mars and Jupiter. It is one of the largest objects in that belt, but it does not dominate its orbital neighborhood the way a planet would, and it isn't round enough to be considered a dwarf planet. Planets are sizable bodies that orbit the Sun, are nearly spherical, and have cleared out most other debris from their orbital path. The asteroid belt is full of many rocky bodies, so Vesta hasn't cleared its region, which is why it isn't a planet. Dwarf planets also orbit the Sun and are nearly round, but they haven't cleared their neighborhoods either. Vesta's shape is irregular rather than nearly round, which further distinguishes it from a dwarf planet. Comets are icy, usually with visible comas or tails when near the Sun, not rocky asteroids in the belt. Vesta doesn't show those cometary characteristics. So the best fit for Vesta is an asteroid—a large rocky body in the asteroid belt.*

**6. The OSIRIS-REx mission collected samples from Bennu, which is classified as what type of Solar System object?**

- A. Comet
- B. Asteroid**
- C. Moon
- D. Planet

*Bennu is a rocky object that orbits the Sun, classifying it as an asteroid. Asteroids are small to mid-sized bodies left over from the Solar System's formation, unlike planets which are larger and have cleared their orbits, or moons which orbit planets. Comets, while also Solar System objects, have icy compositions and develop a visible coma or tail when warmed by the Sun, which Bennu does not. The OSIRIS-REx mission targeted Bennu because it is a near-Earth asteroid, and it collected a sample to return to Earth to study the material from the early solar system.*

**7. Which field of study focuses on the origin and evolution of the universe and its large-scale structure?**

- A. Astronomy
- B. Cosmology**
- C. Astrophysics
- D. Geology

*Cosmology is the study of the origin and evolution of the universe and its large-scale structure. It focuses on big-picture questions like how the universe began, how it has expanded over time, and how matter is arranged on the largest scales into galaxies, clusters, and the cosmic web. This makes it the best fit for a question about the universe as a whole, rather than about individual celestial objects or rocks on Earth. Astronomy covers a wide range of celestial phenomena and objects, but not necessarily the history of the universe as a whole. Astrophysics applies physical laws to understand specific objects and processes within the cosmos, which can include cosmological topics but often centers on stars, black holes, and galaxies themselves. Geology studies the Earth's materials and history, which is unrelated to the origin and evolution of the universe. Observational evidence like the expansion of the universe and the cosmic microwave background underpins cosmology and helps reveal the universe's large-scale structure.*

**8. The first of these objects to be discovered has been reclassified as a dwarf planet. Which object is it?**

- A. Pluto
- B. Ceres**
- C. Haumea
- D. Vesta

*Discovered earliest among the options, Ceres holds the key. It was found in 1801 and, over the years, was labeled a planet, then reclassified as an asteroid, and finally, in 2006, designated a dwarf planet by the IAU. That makes it the first object in the list to be discovered and to have the status of a dwarf planet, which is exactly what the question notes. The other objects were discovered later (Haumea in 2004, Pluto in 1930) or, in Vesta's case, are categorized as a large asteroid rather than a dwarf planet (though Pluto is a dwarf planet now, it wasn't the first discovered among these).*

**9. The Atwood machine belongs to the class of machines that includes block and tackle systems. What is this class?**

- A. Levers
- B. Pulley systems**
- C. Inclined planes
- D. Screws

*Pulley systems are devices that use wheels with grooves to redirect force and, with multiple pulleys, to gain mechanical advantage. The Atwood machine fits this category because it uses a rope passing over a pulley to connect two masses, letting them accelerate while the pulley changes the direction of the force. Block and tackle are simply multiple pulleys arranged to increase the mechanical advantage, all within the same pulley family. Levers, inclined planes, and screws are different kinds of simple machines that operate through a pivoted bar, a ramp, or threaded motion, respectively, and don't describe this setup.*

**10. Phages are viruses that infect which type of organism?**

- A. Bacteria
- B. Phages (viruses that infect bacteria)**
- C. Fungi
- D. Prions

*Phages are bacteriophages—the viruses that infect bacteria. They recognize specific receptors on bacterial surfaces, attach, inject their genetic material, and hijack the bacterial machinery to replicate. This host specificity means their targets are bacteria, not fungi or prions. Fungi are a separate kingdom of eukaryotic organisms, and prions are misfolded proteins that aren't viruses.*

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## 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](mailto:hello@examzify.com).

Or visit your dedicated course page for more study tools and resources:

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

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