# IB DIPLOMA BIOLOGY PRACTICE TEST (SAMPLE)

## STUDY GUIDE



## SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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https://ibdiplomabiology.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.

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# 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!

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# Questions

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**1. What type of chromosome determines sex characteristics in an organism?**

A. Autosome

B. Somatic chromosome

C. Sex chromosome

D. Centromere

**2. In which part of chloroplasts do the light-dependent reactions of photosynthesis occur?**

A. Stroma

B. Grana

C. Thylakoid lumen

D. Outer membrane

**3. What is the role of ATPase enzymes?**

A. To catalyze the conversion of ADP to ATP

B. To hydrolyze phosphate bonds in ATP

C. To synthesize glucose from carbon dioxide

D. To transport molecules across cell membranes

**4. How does the sympathetic nervous system prepare the body for a 'fight or flight' response?**

A. By slowing heart rate

B. By dilating blood vessels

C. By enhancing metabolic rate

D. By promoting digestion

**5. What is the name of the protein that transmits signals in a signaling pathway?**

A. Receptor protein

B. Relay protein

C. Enzyme

D. Structural protein

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**6. What action occurs at the neuromuscular junction?**

A. Conversion of chemical signals to electrical impulses

B. Transmission of action potentials from muscle to nerve

C. Spreading of action potential to adjacent neurons

D. Conversion of electrical impulses to muscle fibre activation

**7. What characterizes a malignant tumour?**

A. It grows slowly and does not spread.

B. It invades and destroys nearby normal tissues.

C. It is always benign and non-harmful.

D. It remains limited to its original tissue.

**8. What term describes organisms that can live with or without oxygen?**

A. Obligate anaerobes

B. Facultative anaerobes

C. Obligate aerobes

D. Microaerophiles

**9. What term describes the part of photosynthesis that occurs in the stroma of chloroplasts?**

A. Light-dependent reactions

B. Light-independent reactions

C. Calvin cycle

D. Electron transport chain

**10. What term is used for the inner lining of some organs and body cavities?**

A. Mucous membranes

B. Multipotent cells

C. Motor neurons

D. Morphological species

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# Answers

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

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# Explanations

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## 1. What type of chromosome determines sex characteristics in an organism?

A. Autosome

B. Somatic chromosome

C. Sex chromosome

D. Centromere

*The correct choice here is the sex chromosome, as these are the specific chromosomes that play a direct role in determining the sex of an organism and the associated characteristics. In many species, including humans, there are two main types of sex chromosomes: X and Y. The combination of these chromosomes typically dictates an organism's sex. For example, having two X chromosomes typically results in a female, while having one X and one Y chromosome typically results in a male. Beyond just determining the sex, these chromosomes also carry genes that can influence secondary sex characteristics, such as the development of different body structures and functions related to reproduction. Autosomes, on the other hand, are chromosomes that are not directly involved in determining sex; they carry the majority of an organism's genetic material and traits unrelated to sex. Somatic chromosomes refer broadly to non-germline cells that make up the body of an organism and can include autosomes but do not specifically indicate their role in sex determination. Lastly, the centromere is a part of a chromosome that plays a role in cell division by ensuring proper segregation of chromosomes but does not influence an organism's sex characteristics.*

## 2. In which part of chloroplasts do the light-dependent reactions of photosynthesis occur?

A. Stroma

B. Grana

C. Thylakoid lumen

D. Outer membrane

*The light-dependent reactions of photosynthesis take place in the grana, which are stacks of thylakoids within the chloroplasts. During these reactions, chlorophyll absorbs light energy, which then initiates the process of photolysis, where water molecules are split to release oxygen, protons, and electrons. This energy is subsequently utilized to drive the synthesis of ATP and NADPH, which are essential for the next stage of photosynthesis—the light-independent reactions or Calvin cycle—occurring in the stroma. The grana's structure is vital for maximizing light absorption, as the thylakoid membranes are where the pigments and various proteins responsible for the electron transport chain and ATP synthesis are located. This organization enables efficient energy conversion processes that are crucial for maintaining the overall function of photosynthesis. While the stroma, thylakoid lumen, and outer membrane play roles within the chloroplast, it is the grana that specifically contain the necessary components for the light-dependent reactions of photosynthesis.*

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## 3. What is the role of ATPase enzymes?

A. To catalyze the conversion of ADP to ATP

B. To hydrolyze phosphate bonds in ATP

C. To synthesize glucose from carbon dioxide

D. To transport molecules across cell membranes

*ATPase enzymes play a crucial role in cellular energy management by hydrolyzing ATP (adenosine triphosphate) into ADP (adenosine diphosphate), inorganic phosphate, and energy. This process is essential because it releases energy that can be used by the cell for various biological functions, such as muscle contraction, active transport of molecules across membranes, and biosynthetic reactions. The hydrolysis of ATP is a key mechanism by which cells convert stored energy into a readily usable form. The other options do not accurately describe the function of ATPase enzymes. For instance, the conversion of ADP to ATP is carried out by ATP synthase during cellular respiration and photosynthesis, not by ATPase. The synthesis of glucose from carbon dioxide involves pathways like photosynthesis mediated by different enzymes, not ATPase. Transporting molecules across cell membranes typically involves transport proteins or pumps, though ATPases can indirectly support this process by providing the necessary energy to power these mechanisms.*

## 4. How does the sympathetic nervous system prepare the body for a 'fight or flight' response?

A. By slowing heart rate

B. By dilating blood vessels

C. By enhancing metabolic rate

D. By promoting digestion

*The sympathetic nervous system is crucial in priming the body for a 'fight or flight' response, particularly through enhancing metabolic rate. When faced with a perceived threat or stressor, the body must prepare itself to act quickly. The sympathetic nervous system triggers a series of physiological changes that increase energy availability. This response involves the release of adrenaline and noradrenaline, hormones that boost glucose release from the liver and increase the breakdown of fats, thereby supplying the body with the energy required for immediate physical exertion. Heightened metabolic activity not only helps in energizing muscles but also enhances alertness and reaction times, which are essential during stressful situations. In contrast, options that suggest slowing heart rate, promoting digestion, or dilating blood vessels may imply a state of relaxation or rest rather than the heightened state of alertness and readiness that characterizes a 'fight or flight' response. Therefore, the role of the sympathetic nervous system in enhancing metabolic rate is critical for preparing the body to respond effectively to threats.*

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## 5. What is the name of the protein that transmits signals in a signaling pathway?

A. Receptor protein

B. Relay protein

C. Enzyme

D. Structural protein

*In a signaling pathway, the protein responsible for transmitting signals is known as a relay protein. These proteins play a crucial role in the cascade of communication that occurs in response to external signals, such as hormones or growth factors. When a molecule binds to a receptor on the surface of a cell, it often triggers a series of events inside the cell, involving several proteins that relay the signal from the receptor to various targets within the cell. This relay mechanism is essential for amplifying and propagating the original signal so that the appropriate cellular response can be initiated. The importance of relay proteins lies in their ability to interface between the receptor proteins, which detect the signal, and other proteins that might mediate a response, such as enzymes that might catalyze a reaction or transcription factors that activate gene expression. Relay proteins can be involved in various processes, including phosphorylation cascades, which are crucial for cell signaling. In contrast, receptor proteins are specific for the initial binding of signaling molecules, while structural proteins primarily provide support or shape to cells and tissues, and enzymes typically catalyze biochemical reactions rather than directly transmitting signals.*

## 6. What action occurs at the neuromuscular junction?

A. Conversion of chemical signals to electrical impulses

B. Transmission of action potentials from muscle to nerve

C. Spreading of action potential to adjacent neurons

D. Conversion of electrical impulses to muscle fibre activation

*At the neuromuscular junction, the process begins when an action potential travels down a motor neuron to its terminal, where it triggers the release of the neurotransmitter acetylcholine into the synaptic cleft. This chemical then binds to receptors on the muscle fiber's membrane, leading to the opening of ion channels and the influx of sodium ions. This change in membrane potential generates an action potential in the muscle fiber itself. As a result, the muscle fiber activates and ultimately contracts. Hence, the action that occurs at the neuromuscular junction involves converting electrical impulses from the neuron into a chemical signal that ultimately leads to the activation of the muscle fibers. In this context, the other options do not accurately describe the primary functions at the neuromuscular junction. The first option refers to the general conversion of signals, while the second discusses a directionality that is not characteristic of the junction itself—the transmission is from neuron to muscle, not muscle to nerve. The third option implies communication between adjacent neurons, which is irrelevant to the specific function of the neuromuscular junction, where the focus is on the interaction between nerve and muscle.*

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## 7. What characterizes a malignant tumour?

A. It grows slowly and does not spread.

B. It invades and destroys nearby normal tissues.

C. It is always benign and non-harmful.

D. It remains limited to its original tissue.

*A malignant tumour is characterized by its ability to invade and destroy nearby normal tissues. This aggressive behavior is due to the cancerous cells' uncontrolled growth and division, which allows them to penetrate surrounding tissues. Malignant tumours can also shed cells into the bloodstream or lymphatic system, leading to metastasis, where cancer spreads to other parts of the body. In contrast, the other descriptions present characteristics of benign tumours or non-cancerous growths. For instance, tumours that grow slowly and do not spread are typically benign. Benign tumours are localized and do not invade surrounding tissues, nor do they pose the same level of threat to health as malignant tumours. Additionally, a benign tumour is defined by its non-harmful nature, while a malignant tumour is, by definition, harmful and can be life-threatening. The assertion that a tumour remains limited to its original tissue applies to benign tumours as well, highlighting that they do not invade or metastasize. Thus, the defining characteristic of a malignant tumour is its invasive and destructive growth pattern.*

## 8. What term describes organisms that can live with or without oxygen?

A. Obligate anaerobes

B. Facultative anaerobes

C. Obligate aerobes

D. Microaerophiles

*The term that describes organisms capable of living with or without oxygen is "facultative anaerobes." These organisms have the flexibility to use aerobic respiration when oxygen is present, but can also switch to anaerobic processes when oxygen is absent, allowing them to thrive in a variety of environments. For example, facultative anaerobes can carry out fermentation or anaerobic respiration in oxygen-depleted conditions, thereby producing energy through different metabolic pathways. This adaptability gives them a significant advantage in fluctuating environments where oxygen levels may change. In contrast, obligate anaerobes cannot survive in the presence of oxygen, as it is toxic to them, while obligate aerobes require oxygen for their survival and cannot carry out anaerobic processes at all. Microaerophiles have a specific requirement for low levels of oxygen and cannot survive in high concentrations.*

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## 9. What term describes the part of photosynthesis that occurs in the stroma of chloroplasts?

A. Light-dependent reactions

B. Light-independent reactions

C. Calvin cycle

D. Electron transport chain

*The process of photosynthesis that happens in the stroma of chloroplasts is accurately described by the term "light-independent reactions." This term refers specifically to the series of biochemical reactions that do not require light to occur directly. Instead, these reactions utilize the products of the light-dependent reactions, such as ATP and NADPH, generated in the thylakoid membranes. In the light-independent reactions, carbon dioxide is fixed into organic molecules through a series of steps, ultimately leading to the synthesis of glucose and other carbohydrates. This set of reactions is often identified as the Calvin cycle, emphasizing its role in carbon fixation and sugar production. Therefore, it is also correct to refer to the light-independent reactions as the Calvin cycle, but the broader term encompasses all aspects of these reactions occurring in the stroma. In summary, light-independent reactions, which include the Calvin cycle, are crucial for synthesizing organic compounds from carbon dioxide, leveraging the energy stored in ATP and NADPH. The distinction from light-dependent reactions, which occur in the thylakoid membranes and involve capturing light energy and producing energy carriers, further clarifies the roles of different phases of photosynthesis.*

## 10. What term is used for the inner lining of some organs and body cavities?

A. Mucous membranes

B. Multipotent cells

C. Motor neurons

D. Morphological species

*The term used for the inner lining of some organs and body cavities is mucous membranes. These membranes are composed of epithelial tissue and underlying connective tissue, serving several vital functions. They play a crucial role in protecting the body by acting as a barrier against pathogens and irritants. Additionally, mucous membranes are involved in secretion, producing mucus that helps to keep tissues moist and assists in the process of absorption. This lining is found in various parts of the body, including the respiratory, digestive, and urogenital tracts. The presence of mucus is particularly important in these areas, as it traps foreign particles and pathogens, aiding in defense mechanisms and facilitating the movement of materials. In contrast, other options such as multipotent cells refer to a type of stem cell with the potential to differentiate into multiple cell types, while motor neurons are nerve cells that carry signals from the brain to muscles. Morphological species refer to a concept in taxonomy based on physical characteristics rather than the function of tissue linings. Each of these terms addresses different biological concepts and does not pertain to the inner lining of organs and cavities.*

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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.

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

https://ibdiplomabiology.examzify.com

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

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