

# Cell Division and Cancer Practice Exam (Sample)

## Study Guide



**Everything you need from our exam experts!**

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# Table of Contents

<b>Copyright</b> .....	<b>1</b>
<b>Table of Contents</b> .....	<b>2</b>
<b>Introduction</b> .....	<b>3</b>
<b>How to Use This Guide</b> .....	<b>4</b>
<b>Questions</b> .....	<b>5</b>
<b>Answers</b> .....	<b>8</b>
<b>Explanations</b> .....	<b>10</b>
<b>Next Steps</b> .....	<b>16</b>

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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 marks the transition from metaphase to anaphase?**
  - A. Formation of spindle fibers**
  - B. Separation of sister chromatids**
  - C. Condensation of chromosomes**
  - D. Reformation of the nuclear envelope**
  
- 2. What effect can nutrition have on side effects experienced by cancer patients?**
  - A. It can worsen the side effects significantly**
  - B. It has no effect on side effects**
  - C. It can help mitigate the severity of side effects**
  - D. It solely depends on the type of cancer**
  
- 3. How does early detection of cancer influence treatment outcomes?**
  - A. It generally leads to poorer treatment options**
  - B. It can allow for more effective treatment and improve survival rates**
  - C. It has no impact on treatment outcomes**
  - D. It complicates the treatment process**
  
- 4. What is a potential consequence of neglecting nutrition in cancer treatment?**
  - A. Improved treatment response**
  - B. Worsening of side effects and complications**
  - C. Increased social support**
  - D. Delayed recovery with minimal impact**
  
- 5. What function does the HER2 receptor serve in breast cancer?**
  - A. It acts as a tumor suppressor that inhibits cell growth**
  - B. It promotes apoptosis in overactive cells**
  - C. It amplifies signaling pathways that drive tumor growth when overexpressed**
  - D. It binds to growth hormones to prevent uncontrolled growth**

- 6. What defines the impact of p53 mutations in the context of cancer treatment?**
- A. They make cancer cells more sensitive to treatment**
  - B. They usually lead to better prognosis**
  - C. They contribute to treatment resistance**
  - D. They always decrease the rate of metastasis**
- 7. What happens to cells when proto-oncogenes are mutated to oncogenes?**
- A. Cells stop dividing**
  - B. Growth regulation is activated**
  - C. Cell growth is overstimulated**
  - D. An increase in apoptosis occurs**
- 8. What differentiates radiation therapy from chemotherapy?**
- A. Radiation therapy uses high-energy rays while chemotherapy uses implants**
  - B. Chemotherapy targets specific tumors while radiation affects the whole body**
  - C. Radiation therapy affects the whole body, while chemotherapy targets specific tumors**
  - D. Radiation therapy uses high-energy rays to target specific tumors**
- 9. What occurs when Ras is malfunctioning in relation to cell division?**
- A. It remains inactive, preventing cell division**
  - B. It continually stimulates division leading to cancer**
  - C. It promotes apoptosis in cells**
  - D. It enhances the signaling pathways for cell repair**
- 10. What is a key indicator of malignant cells compared to benign ones?**
- A. Increased healing abilities**
  - B. Increased ability to invade and spread**
  - C. Decreased growth rate**
  - D. Stability in cell division**

## **Answers**

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

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## **Explanations**

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## 1. What marks the transition from metaphase to anaphase?

- A. Formation of spindle fibers
- B. Separation of sister chromatids**
- C. Condensation of chromosomes
- D. Reformation of the nuclear envelope

The transition from metaphase to anaphase is characterized by the separation of sister chromatids. During metaphase, chromosomes are aligned at the cell's equatorial plane, and each chromosome consists of two sister chromatids connected by a centromere. The crucial moment that marks the shift to anaphase is when the proteins that hold the sister chromatids together are cleaved, allowing them to be pulled apart toward opposite poles of the cell. This separation is essential for ensuring that each daughter cell receives an identical set of chromosomes. The formation of spindle fibers occurs prior to metaphase as the cell prepares for chromosome alignment and separation. Condensation of chromosomes happens in earlier stages of cell division, specifically during prophase, when the chromatin tightens into distinct chromosomes. The reformation of the nuclear envelope occurs later in telophase, after the chromatids have been separated and grouped at the poles. Thus, the accurate identification of sister chromatid separation as the defining event of the transition to anaphase highlights the critical processes involved in proper cell division.

## 2. What effect can nutrition have on side effects experienced by cancer patients?

- A. It can worsen the side effects significantly
- B. It has no effect on side effects
- C. It can help mitigate the severity of side effects**
- D. It solely depends on the type of cancer

Nutrition plays a crucial role in the overall health and well-being of cancer patients, particularly in managing and mitigating the severity of side effects associated with cancer treatments such as chemotherapy and radiation therapy. A well-balanced diet rich in essential nutrients can strengthen the immune system, improve energy levels, and enhance the body's ability to recover from treatments. Specific nutrients can help minimize issues such as nausea, fatigue, and weight loss, which are common side effects experienced during treatment. For instance, adequate hydration and protein intake can help maintain muscle mass and overall strength, while certain vitamins and minerals can help bolster the body's response to treatment. Research has shown that patients who maintain good nutritional status often have better outcomes, tolerate treatments more effectively, and may experience fewer or less severe side effects. Additionally, nutrition can provide psychological benefits, as feeling physically better can improve mood and mental health, which is also important for the healing process. Hence, the assertion that nutrition can help mitigate the severity of side effects is well-supported by clinical evidence and reflects the importance of dietary considerations in cancer care.

### 3. How does early detection of cancer influence treatment outcomes?

- A. It generally leads to poorer treatment options
- B. It can allow for more effective treatment and improve survival rates**
- C. It has no impact on treatment outcomes
- D. It complicates the treatment process

Early detection of cancer significantly influences treatment outcomes by allowing for interventions at a stage when the disease is typically more localized and amenable to treatment. When cancer is caught early, there are generally more treatment options available, and the likelihood of successful treatment increases. This is often because early-stage cancers have not yet spread extensively, which makes them easier to remove surgically or treat with other modalities like radiation or chemotherapy. Moreover, early-stage detection is associated with improved survival rates. Many cancers, when diagnosed at a late stage, can lead to complications that challenge treatment effectiveness, making it difficult to manage the disease. The earlier a cancer is detected, the better the prognosis usually is, as treatments can be tailored more precisely to the specific characteristics of the cancer, allowing for personalized approaches that enhance effectiveness. In summary, early detection is critical because it opens the door to more aggressive and less complicated treatment options, ultimately leading to better survival outcomes for patients.

### 4. What is a potential consequence of neglecting nutrition in cancer treatment?

- A. Improved treatment response
- B. Worsening of side effects and complications**
- C. Increased social support
- D. Delayed recovery with minimal impact

Neglecting nutrition during cancer treatment can lead to a worsening of side effects and complications. Proper nutrition is essential for maintaining the body's strength and supporting the immune system, which can be significantly compromised during cancer therapies such as chemotherapy and radiation. Inadequate nutritional intake can result in malnutrition, which can exacerbate fatigue, increase susceptibility to infections, and impair the overall effectiveness of treatment. Additionally, poor nutrition may hinder the body's ability to heal and recover from treatment, leading to extended recovery times and increased risk of complications. Maintaining a well-balanced diet can help individuals better tolerate treatment, manage side effects, and potentially improve overall outcomes, making nutrition a vital component in the cancer care process.

**5. What function does the HER2 receptor serve in breast cancer?**

- A. It acts as a tumor suppressor that inhibits cell growth**
- B. It promotes apoptosis in overactive cells**
- C. It amplifies signaling pathways that drive tumor growth when overexpressed**
- D. It binds to growth hormones to prevent uncontrolled growth**

The HER2 receptor plays a critical role in the development and progression of certain types of breast cancer, particularly those characterized by HER2 gene amplification or overexpression. When HER2 is overexpressed, it leads to the activation of various signaling pathways that promote cell proliferation, survival, and migration. This aberrant signaling contributes significantly to aggressive tumor growth and poor prognosis in patients with HER2-positive breast cancer. The overexpression of HER2 results in an increase in the number of active receptors on the cell surface, which enhances the signaling cascades that drive cellular processes associated with cancer, such as rapid cell division and resistance to apoptosis. Therefore, understanding this function of HER2 is crucial in both diagnosing HER2-positive breast cancer and developing targeted therapies, such as monoclonal antibodies, that specifically target the HER2 protein to inhibit its activity and slow down tumor growth.

**6. What defines the impact of p53 mutations in the context of cancer treatment?**

- A. They make cancer cells more sensitive to treatment**
- B. They usually lead to better prognosis**
- C. They contribute to treatment resistance**
- D. They always decrease the rate of metastasis**

The impact of p53 mutations in the context of cancer treatment is primarily characterized by their role in contributing to treatment resistance. The p53 protein is a crucial tumor suppressor that regulates the cell cycle, promotes DNA repair, and induces apoptosis in the presence of genetic damage. When mutations occur in the TP53 gene, the resulting p53 protein often loses its tumor-suppressing functions. This can lead to an impaired response to conventional therapies, such as chemotherapy and radiation, which rely on the activation of pathways that p53 helps regulate. In cancers with p53 mutations, cells may evade programmed cell death and continue to proliferate despite treatment. This not only makes these tumors more challenging to treat but also often correlates with a more aggressive disease course, leading to reduced overall survival rates. Thus, the presence of p53 mutations significantly complicates cancer treatment strategies and underscores the importance of developing therapies that can overcome this resistance.

**7. What happens to cells when proto-oncogenes are mutated to oncogenes?**

- A. Cells stop dividing**
- B. Growth regulation is activated**
- C. Cell growth is overstimulated**
- D. An increase in apoptosis occurs**

When proto-oncogenes are mutated to become oncogenes, the primary effect is that cell growth is overstimulated. Proto-oncogenes usually play vital roles in normal cell growth and division by encoding proteins that facilitate these processes. When mutations occur in these genes, they can lead to the production of altered proteins that promote excessive or uncontrolled cell proliferation. This overstimulation of growth often results in the evasion of regulatory mechanisms that normally keep cell division in check, contributing to the formation of tumors. The key distinction here is that while proto-oncogenes help regulate the normal cycle of cell growth, mutated oncogenes can push cells towards hyperproliferation. Thus, the change from a proto-oncogene to an oncogene is crucial in cancer development, as it shifts the balance from normal regulation to unchecked cell division.

**8. What differentiates radiation therapy from chemotherapy?**

- A. Radiation therapy uses high-energy rays while chemotherapy uses implants**
- B. Chemotherapy targets specific tumors while radiation affects the whole body**
- C. Radiation therapy affects the whole body, while chemotherapy targets specific tumors**
- D. Radiation therapy uses high-energy rays to target specific tumors**

Radiation therapy is distinguished by its use of high-energy rays, such as X-rays or gamma rays, specifically to target and destroy cancer cells within defined areas of the body. This targeted approach allows for concentrated doses of radiation to be delivered to the tumor while aiming to minimize damage to surrounding healthy tissue. It is commonly employed for localized cancers, making it highly effective for treating specific tumors or areas where cancer is present. Chemotherapy, in contrast, often works systemically by using chemical substances that can affect the entire body, which can treat cancer that has spread (metastasized) or is at risk of spreading. While some chemotherapy regimens may be used in conjunction with radiation therapy for enhanced effectiveness, chemotherapy typically does not rely on high-energy rays. The understanding of these mechanisms is crucial in cancer treatment as it informs decisions about the best course of action based on the type, location, and stage of cancer.

**9. What occurs when Ras is malfunctioning in relation to cell division?**

- A. It remains inactive, preventing cell division**
- B. It continually stimulates division leading to cancer**
- C. It promotes apoptosis in cells**
- D. It enhances the signaling pathways for cell repair**

When Ras is malfunctioning, it typically leads to a continuous stimulation of cell division, which can result in cancer. Ras is a type of oncogene that plays a critical role in transmitting signals within cells that promote growth and division. Under normal conditions, Ras functions as a switch that is activated by growth factors. When activated, it sends signals that stimulate the proliferation of the cell. If Ras becomes mutated or dysfunctional, it can remain in an active state without the appropriate external signals. This persistent activation leads to uncontrolled cellular proliferation, contributing to the development of tumors and cancer. In essence, the malfunctioning of Ras disrupts the tightly regulated process of cell division, promoting unchecked growth instead, which is a hallmark of many cancers. The other responses do not accurately reflect the role of Ras in cell division and its relationship to cancer progression. For instance, remaining inactive would prevent cell division rather than contribute to cancer, while promoting apoptosis would lead to cell death rather than division, and enhancing repair signaling does not directly tie to the oncogenic function of Ras in the context of cancer.

**10. What is a key indicator of malignant cells compared to benign ones?**

- A. Increased healing abilities**
- B. Increased ability to invade and spread**
- C. Decreased growth rate**
- D. Stability in cell division**

Malignant cells are characterized by their ability to invade surrounding tissues and spread to distant sites in the body, a process known as metastasis. This invasive capability is a significant indicator of malignancy because it reflects the cells' altered growth behaviors and loss of normal regulatory mechanisms that govern cell division and tissue organization. Unlike benign tumors, which typically remain localized and grow slowly without invading adjacent tissues or spreading to other parts of the body, malignant cells display aggressive growth patterns. They can often penetrate the extracellular matrix, facilitating invasion into nearby tissues and the bloodstream or lymphatic system, which can lead to the formation of secondary tumors in other organs. The ability to invade and spread is associated with various molecular and genetic changes in malignant cells, such as increased mobility, altered adhesion properties, and changes in the expression of genes related to invasion and metastasis. This unique feature is crucial for distinguishing between malignant and benign neoplasms and plays a fundamental role in determining the severity of cancer and its treatment approach.

## 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:**

**<https://celldivisioncancer.examzify.com>**

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

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