

EXAM
CODE **354**

CATALOG
NUMBER **BIOx410**

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EXAMS**
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Pathophysiology

CREDIT
HOURS

3

LEVEL

UPPER

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SECTION ONE

Preparing for the Exam

Before You Choose This UExcel Exam

Uses for the Examination

- Excelsior College, the test developer, recommends granting three (3) semester hours of upper-level undergraduate credit to students who receive a letter grade of C or higher on this examination.
- Other colleges and universities also recognize this exam as a basis for granting credit or advanced standing.
- Individual institutions set their own policies for the amount of credit awarded and the minimum acceptable score.

Examinees who have applied to Excelsior College should ask their academic advisor where this exam fits within their degree program.

Examinees **not enrolled** in an Excelsior College degree program should check with the institution from which they wish to receive credit to determine whether credit will be granted and/or to find out the minimum grade required for credit. Those who intend to enroll at Excelsior College should ask an admissions counselor where this exam fits within their intended degree program.

For more information on exam availability and actual testing information, see the [Exam Registration and Information Guide](#).

Examination Length and Scoring

This examination consists of 120 multiple choice and other type questions. You will have two (2) hours to complete the exam. Your score will be reported as a letter grade. Questions are scored either correct (1) or incorrect (0). There is no partial credit. Each credit-bearing exam contains pretest questions, which are embedded throughout the exam. They are indistinguishable from the scored questions. It is to your advantage to do your best on all the questions. Pretest questions are being tried out for use in future versions of the exam.

The UExcel exams do **not** have a fixed grading scale such as A = 90–100%, B = 80–90%, and so forth, as you might have seen on some exams in college courses. Each UExcel test has a scale that is set by a faculty committee and is different for each exam. The process, called standard setting, is described in more detail in the [Technical Handbook](#). Excelsior puts each exam through a standard setting because different test questions have different levels of difficulty. To explain further, getting 70% of the questions right on the exam when the questions are easy does not show the same level of proficiency as getting 70% of questions correct when the questions are hard. Every form of a test (a form contains the test questions) has its own specific grading scale tailored to the particular questions on each exam form.

Please also note that on each form, some of the questions (referred to as pretest questions) count toward the score and some do not; the grading scale applies only to those questions that count toward the score. The area with percentage ratings on the second page of your score report is intended to help identify relative strengths and weaknesses and which content areas to emphasize, should you decide to take the examination again. Your grade

is **based on only the scored questions**. Therefore, the percentage ratings do not necessarily reflect the total percentage that counted toward your grade.

For the best view of the types of questions on this exam, see the sample questions in the back of this guide. Practice, practice, practice!

Score Reporting

For most of our examinations, based on performance, an examinee is awarded a letter grade of A, B, C, or F. A letter grade of D can be given, but credit is awarded for A, B, and C letter grades only. The letter grades reported to examinees indicate that their performance was equivalent to the performance of students who received the same letter grade in a comparable, on-campus course.

More specifically, the letter grade indicates the examinee's proficiency relative to the learning outcomes specified in the exam content guide. Following are general descriptions of examinee performance at each level:

Letter Grade Description

- A Highly Competent: Examinee's performance demonstrates an advanced level of knowledge and skill relative to the learning outcomes.
- B Competent: Examinee's performance demonstrates a good level of knowledge and skill relative to the learning outcomes.
- C Marginally Competent: Examinee's performance demonstrates a satisfactory level of knowledge and skill relative to the learning outcomes.
- D Not Competent (no credit recommended): Examinee's performance demonstrates weak knowledge of the content and minimal skill relative to the learning outcomes.^①
- F Fail (no credit recommended): Examinee's performance demonstrates no knowledge of the content and no skill in the subject relative to the learning outcomes.

Credit is transcribed by Excelsior College for examinees who achieve letter grades of C or higher.

We encourage colleges and universities to use the Excelsior College letter grades of A, B, and C as acceptable standards for awarding credit.

^① In general, two-hour exams do not award a D letter grade.

See page 21, at the back of this content guide, for a sample UExcel Grade Report for Examinations.

Excelsior College Bookstore

The Excelsior College Bookstore offers recommended textbooks and other resources to help you prepare for UExcel exams.

The bookstore is available online at (login required): www.excelsior.edu/bookstore

Excelsior College Library

Library services are available to students enrolled in a degree program at Excelsior College. Created through our partnership with the Sheridan Libraries of The Johns Hopkins University, the library provides access to journal articles, books, websites, databases, reference services, and many other resources. To access the Excelsior College Library, visit www.excelsior.edu/library (login is required). Access to the library is available 24/7.

Take Charge of Your Own Learning

At Excelsior College, independent, self-directed study supported by resources we help you find is not a new concept. We have always stressed to students who take exams that they are acting as their own teacher, and that they should spend as much time studying for an exam as they would spend in a classroom and on homework for a corresponding college course in the same subject area.

Begin by studying the content outline contained in this content guide, at its most detailed level. You will see exactly which topics are covered, and where chapters on those topics can be found in the Recommended Resources. You will see exactly where you might need to augment your knowledge or change your approach.

The content outline, along with the learning outcomes for this exam and recommended textbooks, will serve as your primary resources.

How Long Will It Take Me to Study?

Study for a UExcel exam is comparable to an equivalent college-level course. As an independent

learner, you should study and review as much as you would for the same subject in a campus-based college course. If you already have a background in the subject, you may be able to pass the exam successfully with fewer hours of study. It depends upon the learner as well as the subject, the number of credits (for example, a 6- or 8-credit exam will require more hours of study than a 3-credit exam), and the length of the exam. We strongly encourage you to create a long-term action or study plan, so that you have a systematic approach to prepare for the exam. We've included guidelines for creating such a plan.

How Can I Create an Effective Long-Term Study Plan?

1. Determine the time you will require to complete your preparation for this exam. If you have not studied the subject before, you should plan to budget approximately 45 hours of study time for every credit: 135 hours for 3 credits, 180 hours for 4 credits, 270 hours for 6 credits, and 360 hours for 8 credits. These hours are rules of thumb based on expectations for a student taking a course in the subject; it may take you more or less time, depending on how familiar you are with the material and how easily you absorb the information studying on your own. Aside from the content review, you should then factor in time to search for and use other resources, and to complete any projects and assignments in the study materials that will clarify your understanding of the topics in the content outline (that part in the content guide where the specific areas of study are spelled out). Spend more time on concepts and areas in which you feel you are weak. Totaled, this is approximately the amount of time you should expect to devote to a three-credit, campus-based course. The actual amount of time you require depends on many factors, and will be approximate. If your background is weak, you may need to set aside substantially more than 135–150 hours. If your background is strong, you may budget less time.

Take a few minutes to review the content outline to assess your familiarity with the content. Then, in the space below, write the number of hours you will allocate to complete preparing for the exam.

Hours Required =

2. Determine the time you will have available for study.

In self-study, you need structure, as well as motivation and persistence, and a methodical approach to preparation. There is no set class to keep you on task. You have to do that yourself. Construct a time-use chart to record your daily activities over a one-week period. The most accurate way to do this is to complete the chart on a daily basis to record the actual amount of time you spend eating, sleeping, commuting, working, watching television, caring for others and yourself, reading, and everything else in an adult's life. However, if your schedule is regular, you might prefer to complete the chart in one sitting and, perhaps, by consulting your appointment book or planner.

After you have recorded your activities, you will be ready to schedule study periods around these activities or, perhaps, instead of some of them. In the space below, write the number of hours you will be able to set aside for study each week.

Hours Required =

3. Divide the first number by the second number.

This will give you the number of weeks you will need to set aside for independent study. For example, if you think you will require 170 hours of study and you have 10 hours available to study each week, divide 170 hours by 10 hours and you will get 17. This means that you will need about 17 weeks to complete this course of study. However, you will also need to allow about a week for review and self-testing. Moreover, to be on the safe side, you should also add two weeks to allow for unforeseen obstacles and times when you know you will not be able to study (e.g., during family illnesses or holidays). So, in this case, you should allot a total of 18 to 19 weeks to complete your study.

4. Schedule your examination to coincide with the end of your study period.

For example, if you plan to allow 18 weeks for study, identify a suitable examination date and begin study at least 18 weeks before that date. (The date you begin study assumes that you will have received all of your study materials, particularly textbooks, by that time.)

5. Format a long-term study plan.

You will need to use a calendar, planner, or some other tool to format and track your long-term study plan. Choose a method that is convenient and one that keeps you aware of your study habits on a daily basis. Identify the days and exact hours of each day that you will reserve for study throughout your whole independent study period. Check to see that the total number of hours you designate for study on your long-term study plan adds up to the number of hours you have determined you will need to complete this course of study (Step 1).

6. Record in your long-term study plan the content you plan to cover during each study period.

Enter the session numbers, review, and examination preparation activities you will complete during each study period. While it is suggested that approximately 160–170 hours of study is required for this exam, each and every student may require different timelines based on their comfort with, and comprehension of, the material.

You now have a tentative personal long-term study plan. Keep in mind that you will have to adjust your study plan, perhaps several times, as you study. It is only by actually beginning to work systematically through the material, using the content outline, that you will be able to determine accurately how long you should allow for each unit.

What Learning Strategy Should I Use?

The following guidelines are intended to help you acquire the grounding in the knowledge and skills required for successful completion of this examination.

1. Approach learning with a positive attitude.

Most students are capable of learning subject content if they devote enough time and effort to the task. This devotion will give you a positive edge and a feeling of control.

2. Diligently complete the exact work you specified in your study plan.

Your study plan is being designed for the specific purpose of helping you achieve the learning outcomes for this exam.

3. Be an active learner.

You should actively engage in the learning process. Read critically, take notes, and continuously monitor your comprehension. Keep a written record of your progress, highlight content you find difficult to grasp, and seek assistance from someone in your learning community who can help you if you have difficulty understanding a concept.

4. Be patient: you may not understand everything immediately.

When encountering difficulty with new material, be patient with yourself and don't give up. Understanding will come with time and further study. Sometimes you may need to take a break and come back to difficult material. This is especially true for any primary source material (original letters, documents, and so forth) that you may be asked to read. The content outline will guide you through the material and help you focus on key points. You will find that many concepts introduced in earlier sessions will be explained in more detail in later sessions.

5. Apply your learning to your daily life.

Use insights you gain from your study to better understand the world in which you live. Apply the learning whenever you can. Look for instances that support or contradict your reading on the subject.

6. Accommodate your preferred way of learning.

How do you learn best? Common ways to learn are reading, taking notes and making diagrams, and by listening to someone (on video or live). Others learn by doing. Do any of these descriptions apply to you? Or does your learning style vary with the learning situation? Decide what works for you and try to create a learning environment to accommodate your preferences.

Study Tips

Become an active user of the resource materials. Aim for understanding rather than memorization. The more active you are when you study, the more likely you will be to retain, understand, and apply the information.

The following techniques are generally considered to be active learning:

- **preview or survey** each chapter

- **highlight or underline text** you believe is important
- **write questions or comments** in the margins
- **practice re-stating content** in your own words
- **relate what you are reading** to the chapter title, section headings, and other organizing elements of the textbook
- **find ways to engage** your eyes, your ears, and your muscles, as well as your brain, in your studies
- **study with a partner or a small group**
- **prepare your review notes** as flashcards or create recordings that you can use while commuting or exercising

When you feel confident that you understand a content area, review what you have learned. Take a second look at the material to evaluate your understanding. If you have a study partner, the two of you can review by explaining the content to each other or writing test questions for each other to answer. Review questions from textbook chapters may be helpful for partner or individual study, as well.

Study smart for your UExcel exam! Success starts with establishing a relationship with your advisor.

Using UExcel Practice Exams

The official UExcel practice exams are highly recommended as part of your study plan. They can be taken using any computer with a supported web browser such as Google Chrome.

The practice exam package comes with two sets of questions. Please be aware that there will be fewer questions on the practice exams than there will be on the exam you take for credit. Generally, the practice questions will not be the same as the ones you will see when you take the actual exam for credit. They are intended to expose you to the types of questions you'll encounter in the actual exam. Practice questions are a tool, and do not provide a full exam experience. For example, the practice question sets do not have time limitations. Begin with the Content Guide, especially the detailed content outline. Memorizing specific questions and answers on the practice sets is not as effective as using the questions to practice, along with the content outline, to see which concepts you may need to study further. To register for the practice exam, visit www.excelsior.edu and log into your MyExcelsior

account. **Please note: You must be registered for the corresponding credit-bearing exam before you can register for the practice exam.**

Practice exams are not graded. Rather, they are intended to help you make sure you understand the subject and give you a sense of what the questions will be like on the exam for credit. Ideally, you would check any questions you got wrong, look at the explanations, and go back to the textbook to reinforce your understanding. After taking both forms of the practice exam, you should feel confident in your answers and confident that you know the material listed in the content outline.

Practice exams are one of the most popular study resources. Practice exams are typically shorter than the credit-bearing exam. Since the questions are drawn from the same pool of questions that appear on the credit-bearing exam, what you will see when you sit for the graded exam will be roughly the same. Used as intended, these practice exams will enable you to:

- Review the types of questions you may encounter on the actual exam.
- Practice testing on a computer in a timed environment.
- Practice whenever and wherever it is convenient for you.

Take two different forms of a practice exam within a 180-day period. (We highly recommend that you take the first form of the practice exam as a pretest, early in the study period. Use the results to identify areas to further study and carry out a plan. Then take the second form as a post-test and see how much you have improved.)

Although there is no guarantee, our research suggests that exam takers who do well on the practice exams are more likely to pass the actual exam than those who do not take advantage of the opportunity. Note that since the practice exams are not graded (calibrated) the same way as the scores on the credit-bearing exam, it will be hard for you to use the practice exams as a way to predict your score on the credit-bearing exam. The main purpose of the practice exams is for you to check your knowledge and to become comfortable with the types of questions you are likely to see in the actual, credit-bearing exam.

About Test Preparation Services

Preparation for UExcel® exams and Excelsior College® Examinations, though based on independent study, is supported by Excelsior College with a comprehensive set of exam learning resources and services designed to help you succeed. These learning resources are prepared by Excelsior College so you can be assured that they are current and cover the content you are expected to master for the exams. These resources, and your desire to learn, are usually all that you will need to succeed.

There are test-preparation companies that will offer to help you study for our examinations. Some may imply a relationship with Excelsior College and/or make claims that their products and services are all that you need to prepare for our examinations.

Excelsior College does not endorse the products and services of any tutorial or test preparation firm. We do not review the materials provided by these firms for the content or compatibility of their material and resources with UExcel® exams or Excelsior College Examinations®. No test preparation vendor is authorized to provide admissions counseling or academic advising services, or to collect any payments, on behalf of Excelsior College. Excelsior College does not send authorized representatives to a student's home nor does it review the materials provided by test preparation companies for content or compatibility with Excelsior College examinations.

To help you become a well-informed consumer, we suggest that before you make any purchase decision regarding study materials provided by organizations other than Excelsior College, you consider the points outlined on our website at www.excelsior.edu/testprep.

Exam Preparation Strategies

Each learner is different. However, all learners should read the content outline in the exam's Content Guide and ensure that they have mastered the concepts. For someone with no prior knowledge of the subject, a rule of thumb is 135 hours of study for a 3-credit exam—this number is just to give you an idea of the level of effort you will need, more or less.

Content Guides

This content guide is the most important resource. It lists the outcomes, a detailed content outline of what is covered, and textbooks and other study resources. It also has sample questions and suggestions for how to study. Content guides are updated periodically to correspond with changes in particular examinations and in textbook editions. Examinees can download any of the latest free UExcel content guides by visiting the individual exam page or from the list at www.excelsior.edu/contentguides.

Using the Content Outline

Each content area in the content outline includes the most important sections of the recommended resources for that area. These annotations are not intended to be comprehensive. You may need to refer to other chapters in the recommended textbooks. Chapter numbers and titles may differ among textbook editions.

This content outline contains examples of the types of information you should study. Although these examples are many, do not assume that everything on the exam will come from these examples. Conversely, do not expect that every detail you study will appear on the exam. Any exam is only a broad sample of all the questions that could be asked about the subject matter.

Using the Sample Questions and Rationales

Each content guide provides sample questions to illustrate those typically found on the exam. These questions are intended to give you an idea of the level of knowledge expected and the way questions are typically phrased. The sample questions do not sample the entire content of the exam and are not intended to serve as an entire practice test.

Recommended Resources for the UExcel Exam in Pathophysiology

The resources listed below were selected by the faculty members on the examination committee for use in developing this exam.

Resources listed under “Strongly Recommended” were used by the committee to verify all the questions on the exam. Please refer to the Content Outline to see which parts of the exam are cross-referenced to these resources.

Resources listed under “Optional” provide additional material that may deepen or broaden your understanding of the subject, or that may provide an additional perspective on the exam content. Textbook resources, both Strongly Recommended and Optional, may be purchased from the [Excelsior College Bookstore](#).

You should allow ample time to obtain the necessary resources and to study sufficiently before taking the exam, so plan appropriately, with an eye towards your own personal learning needs. See the sections in this guide on the Excelsior College Bookstore and the Excelsior College Library, and under Reducing Textbook Costs, to help you secure the Strongly Recommended resources successfully.

Textbook Editions

Textbook editions listed in the UExcel content guides may not be the same as those listed in the bookstore. Textbook editions may not exactly match up in terms of table of contents and organization, depending upon the edition. However, our team of exam developers checks exam content against every new textbook edition to verify that all subject areas tested in the exam are still adequately available in the study materials. If needed, exam developers will list additional Strongly Recommended resources to ensure that all topics in the exam are still sufficiently covered. Public libraries may have the textbooks you need, or may be able to obtain them for you through interlibrary loan to reduce textbook costs. You may also consider financial aid, if you qualify, to further help defray the steep cost of textbooks. A section on open educational

resources (OER) has been included in this guide to help you locate additional, possibly free resources to augment your study.

Strongly Recommended

Copstead, L.C., & Banasik, J.L. (2018). *Pathophysiology* (6th ed.). Philadelphia: Saunders.

Copstead, L.C., & Banasik, J.L. (2018). *Study guide for Copstead/Banasik Pathophysiology* (6th ed.). Philadelphia: Saunders.

Optional Resources

The following texts were identified by the examination development committee as a resource to help you gain a deeper understanding of the subject. If you would like to explore specific topics in more depth, we encourage you to refer to available Open Educational Resources (OER).

McCance, K.L., & Heuther, S.E. (2017). *Pathophysiology: The biologic basis for disease in adults and children* (8th ed.). St. Louis: Mosby.

Norris, T., & Lalchandani, R. (2014). *Porth's Pathophysiology* (10th ed.). Philadelphia: Lippincott.

The study materials may be purchased from the [Excelsior College Bookstore](#).

Open Educational Resources

There are many resources available online free of charge that may further enhance your study for the exam. Known as Open Educational Resources (OER), these may be textbooks, courses, tutorials, or encyclopedias. Any additional OER that you find independently should be used to augment study—not as replacements for the Strongly Recommended resources.

Most sites for university-based OER can be searched through www.ocwconsortium.org and/or www.oercommons.org.

Sites that specialize in web courses designed by college professors under contract with the website sponsor, rather than in web versions of existing college courses, include:

www.education-portal.com

www.opencourselibrary.org (abbreviated as OCL)

We have included specific courses that cover material for one or more UExcel® exams from the sites in the listings above. It's worth checking these sites frequently to see if new courses have been added that may be more appropriate or may cover an exam topic not currently listed.

Sites like Khan Academy (www.khanacademy.com) and iTunes U feature relatively brief lessons on very specific topics rather than full courses. Full courses are also available on iTunes U (<http://www.apple.com/education/ipad/itunes-u/>). We have chosen a few courses and collections for this listing.

Open Online Textbooks

BookBoon

<http://bookboon.com/en/textbooks-ebooks>

Flatworld Knowledge

<http://catalog.flatworldknowledge.com/#our-catalog>

College Readiness

Khan Academy

<http://www.khanacademy.org/>

Hippocampus

<http://www.hippocampus.org/>

Open Course Library

<http://opencourselibrary.org/collg-110-college-success-course/>

Study Aids

Education Portal

<http://education-portal.com/>

Khan Academy

<http://www.khanacademy.org/>

Annenberg Learner

<http://www.learner.org/>

OpenCourseWare

<http://ocwconsortium.org/en/courses/search>

OER Commons

<http://www.oercommons.org/>

Open Course Library

<http://www.opencourselibrary.org/>

To achieve academic success, rate yourself at Excelsior College's Self-Regulated Learning Lab. Visit the Diagnostic Assessment & Achievement of College Skills site at <https://srl.daacs.net/>

It's free!

Content Outline

General Description of the Examination

The UExcel Pathophysiology examination is based on material typically taught in a one semester, three-credit, upper-level course in pathophysiology.

The examination measures understanding of the physiologic mechanisms altered by disease in the living organism, focusing on the altered health states of adults, and includes clinical presentations, signs and symptoms, appropriate diagnostic studies, and global concepts of treatment.

Those beginning to study for this exam should be familiar with concepts generally covered in lower-level courses in normal anatomy and physiology and microbiology, and should also have an awareness of the basic concepts of biochemistry and immunology.

Learning Outcomes

After you have successfully worked your way through the recommended study materials, you should be able to demonstrate the following learning outcomes:

1. Describe cell biology, mechanisms of injury, types of cellular adaptation, genetic disorders, and neoplasia. (Aligns to GECC 2.1)
2. Identify the various forms of host defense and hematological responses. (Aligns to GECC 2.1)
3. Describe cardiac excitation and disturbance, valvular dysfunction, cardiac mechanisms, heart failure, atherosclerosis, hypertension, heart disease, shock, and infection. (Aligns to GECC 2.1)
4. Describe respiratory dysfunctions, such as obstructions, restrictions, cardiovascular lung diseases, altered gas exchange, respiratory failure, infection, neoplasia, and related risk factors. (Aligns to GECC 2.1)
5. Describe renal dysfunctions, including fluid, acid, and electrolyte imbalance, acute and chronic renal failure, end-stage renal disease, nephrosis, neoplasia, and stone formations. (Aligns to GECC 2.1)
6. Describe and explain the related diseases of the neurological and musculoskeletal systems, including head and neck trauma; seizures; vascular insult; infections/inflammation; altered neural-physiological, neuro-muscular, and musculoskeletal functions; pain; and neoplasia. (Aligns to GECC 2.1)
7. Describe gastrointestinal dysfunctions, nutrition imbalances, and related disorders such as compromised motility and absorption, diseases related to peptic ulcers and inflamed bowel, and pancreatic and hepatic/gallbladder disorders. (Aligns to GECC 2.1)

8. Describe diseases of the endocrine system, such as those related to hypothalamic-pituitary function, thyroid and parathyroid dysfunction, and altered adrenal function. (Aligns to GECC 2.1)
9. Recognize the signs and symptoms of a particular physical disorder. (Aligns to GECC 2.1)
10. Identify and apply knowledge of diagnostic studies for a variety of system dysfunctions, including recognizing normal lab values. (Aligns to GECC 2.1)
11. Identify and apply treatment for various clinical diagnoses. (Align to GECC 2.1)

General Education Career Competencies Addressed in this Exam

GECC-2: Mathematical and Scientific Problem Solving: Apply scientific knowledge and reasoning to make evidence-based decisions.

Content Outline

The content outline describes the various areas of the test, similar to the way a syllabus outlines a course. To fully prepare requires self-direction and discipline. Study involves careful reading, reflection, and systematic review.

The major content areas on the Pathophysiology examination, the percent of the examination devoted, and the hours to devote to each content area are listed below.

Content Area	Percent of the Examination	Hours of Study*
I. Cell Biology/Mechanisms of Cell Injury/Neoplasia	10%	14
II. Host Defense/Hematology	16%	22
III. The Cardiovascular System	15%	20
IV. The Respiratory System	11%	15
V. The Renal System/Fluids and Electrolytes/Acid-Base	12%	16
VI. Neurology and the Musculoskeletal System	10%	14
VII. The Gastrointestinal System/Nutrition/The Endocrine System/ The Reproductive System	16%	22
VIII. Clinical Applications Related to the Various Systems	10%	14
Total	100%	

*Approximate: For those examinees who know the topic well, less time may be needed to learn the subject matter. For those who are new to the subject matter, more time may be required for study.

NOTE: Occasionally, examples will be listed for a content topic to help clarify that topic. However, the content of the examination is not limited to the specific examples given.

I. Cell Biology/Mechanisms of Cell Injury/Neoplasia

10 PERCENT OF EXAM

Copstead

Unit I, Pathophysiologic Processes

Unit II, Cellular Function

A. Cellular adaptation

1. Atrophy
2. Hypertrophy
3. Hyperplasia
4. Metaplasia
5. Dysplasia

B. Cellular injury

1. Reversible (for example: swelling)
2. Irreversible
 - a. Necrosis
 - b. Apoptosis
 - c. Fatty changes
3. Mechanisms
 - a. Hypoxia
 - b. Hyperoxia/free radicals
 - c. Nutritional deficits
 - d. Chemical injury
 - e. Infectious agents
 - f. Physical and mechanical injury (trauma)
4. Intracellular accumulation (for example: Tay-Sachs, glycogen storage, hemochromatosis)

C. Genetic disorders

1. Chromosomal abnormalities (for example: Down syndrome)
2. Mutations (for example: sickle cell anemia, thalassemias, cystic fibrosis)

D. Neoplasia

1. Nomenclature/classification/naming of neoplasias
 - a. Characteristics of benign neoplasms
 - b. Characteristics of malignant neoplasms
 - c. Mechanisms of metastasis
2. Mechanisms of oncogenesis
 - a. Viral oncogenesis
 - 1) Oncogenes
 - 2) Tumor suppressor genes
 - b. Radiation-induced oncogenesis (for example: UV radiation)
 - c. Chemical-induced oncogenesis (for example: cigarette smoking, asbestos)
3. Tumor markers
 - a. Prostate-specific antigen (PSA)
 - b. α -fetoprotein (AFP)
 - c. Carcinoembryonic antigen (CEA)
4. Effects of the tumor on the host
 - a. Paraneoplastic syndromes
 - b. Thrombosis/hemorrhage
 - c. Pain

II. Host Defense/Hematology

16 PERCENT OF EXAM

Copstead

Unit III, Defense

Unit XV, Integumentary System

A. Alterations in integument function

1. Mechanical barriers
 - a. Burns

- b. Trauma (for example: abrasions)
 - 2. Disorders of the skin
 - a. Inflammatory response (for example: psoriasis, acne, lupus)
 - b. Allergic response
 - c. Neoplastic (for example: basal cells, malignant melanoma, and associated risk factors such as fair skin, UV light exposure, heredity, moles, etc.)
- B. Inflammation**
1. Local manifestation (chemical/cellular response)
 - a. Acute (hemodynamic changes and inflammatory mediators)
 - b. Chronic (granuloma and inflammatory mediators)
 - c. Healing
 - d. Exudates
 2. Systemic manifestation
 - a. Chemical/cellular response
 - b. Fever/pain
 - c. Global immune response
- C. Alterations in wound healing**
1. Dysfunction in inflammatory response
 2. Nutritional factors
 3. Congenital factors
 4. Complicating factors (for example: diabetes, autoimmune)
 5. Impaired perfusion (for example: surgical wounds, stasis and decubitus ulcers)
- D. Alterations in immune function**
1. Primary immune deficiencies (congenital)
 - a. Severe combined immunodeficiency
 - b. Wiskott-Aldrich syndrome
 - c. T-cell disorders
 - d. B-cell disorders
 2. Secondary immune deficiencies (acquired)
 - a. HIV
 - b. AIDS
 - c. Iatrogenic immune deficiency (for example: trauma, stress, chemo-radiation)
- E. Alterations in the hematological system**
3. Autoimmunity disease
 - a. Localized (for example: Graves' disorder, Hashimoto's thyroiditis)
 - b. Generalized or systemic (for example: lupus scleroderma)
 4. Hypersensitivity reactions
 - a. Type I: atopic hypersensitivity or anaphylactic allergic reaction
 - b. Type II: cytotoxic or cytolytic hypersensitivity
 - c. Type III: immune complex or Arthus reaction
 - d. Type IV: delayed hypersensitivity
 5. Immunization/vaccination
 - a. Active
 - b. Passive
 - c. Immunomodulating agents/ adjuvants (for example: BCG – bacille Calmette-Guérin colony stimulating factors)
 - d. Immunotherapy (for example: interferon, monoclonal antibodies)
 6. Immunocompromised host
 - a. Etiology
 - 1) Primary, such as HIV and diabetes
 - 2) Secondary due to chemotherapy or steroid therapy
 - b. Risks (for example: opportunistic infections)
 - c. Preventive measures (for example: avoiding crowds in flu season)
 7. Transplantation reactions
 - a. Graft-versus-host disease (GvHD)
 - b. Rejection
 - c. Blood transfusion reactions

1. Disorders of red blood cells
 - a. Anemia
 - 1) Due to decreased RBC production (for example: iron deficiency, vitamin B12 and folic acid deficiencies)
 - 2) Due to blood loss
 - 3) Due to increased destruction (for example: hemolytic anemia, sickle cell anemia)
 - b. Polycythemia
 - 1) Primary
 - 2) Secondary
2. Disorders of white blood cells
 - a. Leukopenia
 - b. Leukocytosis
 - c. Leukemia
 - 1) Acute lymphocytic
 - 2) Chronic lymphocytic
 - 3) Acute myelogenous
 - 4) Chronic myelogenous
 - d. Multiple myeloma
3. Disorders of platelets
 - a. Thrombocytopenia
 - b. Alterations in platelet function
4. Disorders of plasma and hemostasis
 - a. Nutritional deficiencies
 - b. Hemophilia A
 - c. Hemophilia B
 - d. Other coagulation deficiencies (for example: vitamin K deficiency)
 - e. Factors predisposing to thrombosis
 - f. Clinical determination of coagulation value
 - g. Disseminated intravascular coagulation (DIC)

III. The Cardiovascular System

15 PERCENT OF EXAM

Copstead

Unit V, Cardiac Function

A. Cardiac excitation/rhythmic disturbances

1. Action potentials (fast response/slow response)
2. Disorders of conduction
 - a. Atrial (for example: tachycardia)
 - b. Ventricular (for example: tachycardia, bradycardia)
3. Enhanced automaticity/ectopy (for example: PVC)
4. Re-entry (for example: SVT)
5. Abnormal conduction pathways (for example: heart block, Wolff-Parkinson-White syndrome)

B. Valvular function/dysfunction

1. Mitral stenosis/regurgitation
2. Aortic stenosis/regurgitation
3. Tricuspid/pulmonic disease

C. Cardiac mechanics/heart failure

1. Congestive heart failure
 - a. Etiology
 - b. Basic mechanism
 - c. Compensatory responses
 - d. Clinical manifestations
 - 1) Right-sided heart failure
 - 2) Left-sided heart failure
 - 3) Backward failure (low-output failure) vs. forward failure (high-output failure)
2. Cardiogenic shock
3. Transplant

D. Atherosclerosis

1. Risk factors
2. Vascular disease
3. Coronary artery disease

- a. Clinical presentation/angina
- b. Cardiac ischemia
- c. Cardiac injury
- d. Cardiac infarct
- e. Complications/sequelae

E. Hypertension

- 1. Renin-angiotensin-aldosterone system
- 2. Risk factors
- 3. Classification
 - a. Primary
 - b. Secondary
- 4. End organ effects (for example: left ventricular hypertrophy)

F. Congenital heart disease

- 1. Acyanotic defects (for example: septal defects)
- 2. Cyanotic defects (for example: tetralogy of Fallot)

G. Pericardial disease

- 1. Effusion
- 2. Pericarditis

H. Peripheral vascular disease

- 1. Arterial
 - a. Occlusive arterial disease
 - b. Aneurysmal arterial disease
 - c. Aortic dissection
- 2. Venous
 - a. Thromboembolic venous disease
 - b. Superficial thrombophlebitis
 - c. Acute deep vein thrombosis
 - d. Varicose veins

I. Embolic disease

- 1. Etiology
- 2. Sequelae

J. Shock

- 1. Hypovolemic
- 2. Septic

K. Infection

- 1. Rheumatic heart disease
- 2. Infective endocarditis

IV. The Respiratory System

11 PERCENT OF EXAM

Copstead

Unit IV, Oxygen Transport, Blood Coagulation, Blood Flow, and Blood Pressure

Unit VI, Respiratory Function

A. Obstructive diseases

- 1. Chronic obstructive pulmonary disease (COPD)
 - a. Asthma
 - 1) Extrinsic
 - 2) Intrinsic
 - b. Chronic bronchitis
 - c. Emphysema
- 2. Bronchiectasis
- 3. Cystic fibrosis

B. Restrictive diseases

- 1. Extrinsic
 - a. Pneumothorax
 - b. Pleural effusion
 - c. Kyphoscoliosis
 - d. Ankylosing spondylitis
 - e. Neuromuscular disease
 - 1) Guillain-Barré syndrome
 - 2) Myasthenia gravis
 - f. Pickwickian syndrome/ sleep apnea
- 2. Intrinsic
 - a. Sarcoidosis
 - b. Pulmonary fibrosis (for example: pneumoconiosis)

C. Cardiovascular diseases of the lung

- 1. Pulmonary embolism
- 2. Pulmonary hypertension

3. Cor pulmonale
- D. Alterations in gas exchange**
1. Hypoxemia
 2. Hypoxia
 3. Hypercapnia
 4. Ventilation-perfusion mismatch
- E. Respiratory failure**
1. Acute respiratory failure
 2. Adult respiratory distress syndrome (ARDS)
 3. Infant respiratory distress syndrome
- F. Infection**
1. Atelectasis
 2. Pneumonia (for example: bacterial, viral, pneumocystis)
 3. Tuberculosis
- G. Neoplasia**
1. Small (oat) cell
 2. Large cell
 3. Squamous cell
 4. Adenocarcinoma
 5. Oral laryngeal cancer/ bronchogenic cancer
- H. Risk factors**

V. The Renal System/Fluids and Electrolytes/ Acid-Base

12 PERCENT OF EXAM

Copstead

Unit VII, Fluid, Electrolyte, and Acid-Base Homeostasis

Unit VIII, Renal and Bladder Function

A. Fluid imbalance

1. Control of fluid volume
2. Deficit
3. Excess

B. Electrolyte imbalance, including etiology, effect, and clinical manifestation of imbalances in the following:

1. Potassium
2. Sodium
3. Calcium
4. Magnesium
5. Phosphate
6. Chloride

C. Acid-base imbalance

1. Acidosis
2. Alkalosis
3. Buffers
4. Compensatory mechanisms

D. Acute renal failure

1. Prerenal
2. Intrarenal
3. Postrenal

E. Chronic renal failure

1. Electrolyte imbalances
2. Physiological changes
3. Dialysis
4. Transplant

F. End-stage renal disease

G. Infection

1. Pyelonephritis

2. Urogenital infection
 3. Glomerulonephritis
- H. Disorders of the bladder**
1. Cystitis
 2. Neurogenic bladder
- I. Nephrotic syndrome**
- J. Neoplasia**
- K. Stone formation**

VI. Neurology and the Musculoskeletal System

10 PERCENT OF EXAM

Copstead

Unit XII, Neural Function

Unit XIV, Musculoskeletal Support and Movement

A. Traumatic injury

1. Head
 - a. Blunt trauma (concussion)
 - b. Increased intracranial pressure (cerebral edema)
 - c. Hematoma
 - d. Craniofacial trauma
2. Spinal cord: Mechanisms of injury
 - a. Spinal shock
 - b. Autonomic dysreflexia
 - c. Chronic injury consideration

B. Seizure disorders

1. Epilepsy
 - a. Partial (focal) (for example: temporal lobe)
 - b. Generalized (absence [petit mal] and tonic-clonic [grand mal]) seizures
 - c. Status epilepticus
2. Other (drug, febrile, traumatic, tumor)

C. Vascular insult

1. Cerebrovascular accident (CVA)

- a. Hemorrhagic
 - b. Thromboembolic
 - c. AV malformations and aneurysms
2. Transient ischemic attack (TIA)

D. Infections/inflammation

1. Meningitis
2. Guillain-Barré syndrome
3. Encephalitis
4. Reye's syndrome
5. Polio
6. Abscess

E. Alterations in neural psychological function

1. Alzheimer's disease
2. Psychotic illness (for example: schizophrenia, major affective disease, delusional disorder)
3. Nonpsychotic illness (for example: anxiety disorders, personality disorders)

F. Alterations in neuromuscular function

1. Parkinson's disease
2. Multiple sclerosis
3. Myasthenia gravis
4. Amyotrophic lateral sclerosis (ALS)

G. Pain

1. Types of pain
2. Pain assessment
3. Mechanisms (pathways)
4. Endorphins-opioid receptors
5. Management of pain

H. Alterations of the musculoskeletal system

1. Muscle disorders
 - a. Muscular dystrophy
 - b. Myopathies
2. Joint disorders
 - a. Noninflammatory joint disorders, such as osteoarthritis
 - b. Inflammatory joint disorders

- 1) Noninfectious joint disorders
 - (a) Rheumatoid arthritis
 - (b) Ankylosing spondylitis
 - (c) Gout
 - (d) Psoriatic arthritis
- 2) Infectious joint disorders
 - (a) Septic arthritis
 - (b) Lyme disease
3. Bone disorders
 - a. Osteomyelitis
 - b. Paget's disease
 - c. Osteoporosis
 - d. Osteomalacia
 - e. Rickets
 - f. Trauma (for example: fractures)
 - 1) Complete – closed, open, comminuted
 - 2) Incomplete – greenstick, stress
 - 3) Dislocation/subluxation
- I. Neoplasia
 1. Tumors of the brain and spinal cord (for example: gliomas, meningiomas, neurofibroma, angioma)
 2. Tumors of the skeletal system (for example: osteosarcoma, fibrosarcoma)
 3. Tumors of the muscular system (for example: rhabdomyosarcoma)

VII. The Gastrointestinal System/Nutrition/ The Endocrine System/The Reproductive System

16 PERCENT OF EXAM

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Unit IX, Genital and Reproductive Function

Unit X, Gastrointestinal Function

Unit XI, Endocrine Function, Metabolism, and Nutrition

A. Disorders of motility

1. Nausea and vomiting
2. Achalasia (cardiospasm)
3. Reflux esophagitis/gastroesophageal reflux disease (GERD)
4. Hiatal hernia
5. Diarrhea/constipation

B. Disorders of absorption

1. Malabsorption syndromes
2. Sprue (celiac disease)

C. Peptic ulcer disease

1. Types
 - a. Gastric
 - b. Duodenal
2. Pathogenesis (for example: back diffusion, *Helicobacter pylori*)
3. Clinical manifestations

D. Inflammatory bowel disease

1. Ulcerative colitis/Crohn's disease
2. Pathogenesis
3. Clinical manifestations

E. Hepatic/gallbladder disorders

1. Jaundice (prehepatic such as hemolytic, intrahepatic, posthepatic)
2. Viral hepatitis
3. Cirrhosis
 - a. Necrotic
 - b. Toxic
 - c. Alcoholic

- d. Pathogenetic
- 4. Cholecystitis/cholelithiasis
- 5. Clinical manifestations
 - a. Liver disease
 - b. Gallbladder disease
 - c. Alcoholism
- F. Disorders of the pancreas**
 - 1. Exocrine (pancreatitis – acute and chronic)
 - 2. Endocrine – Diabetes mellitus
 - a. Risk factors
 - b. Insulin-dependent (type 1) vs. noninsulin-dependent (type 2)
 - c. Long-term effects
 - d. Complications such as diabetic ketoacidosis
- G. Alterations of hypothalamic-pituitary function**
 - 1. Panhypopituitarism (Simmonds' disease, Sheehan's syndrome)
 - 2. Pituitary adenoma and consequences
 - 3. Acromegaly and galactorrhea/amenorrhea
 - 4. Diabetes insipidus
 - 5. Syndrome of inappropriate ADH secretion
- H. Alterations of thyroid function and parathyroid function**
 - 1. Thyrotoxicosis (hyperthyroidism)
 - 2. Graves' disease
 - 3. Toxic nodular goiter
 - 4. Hashimoto's thyroiditis
 - 5. Complications resulting from T_4/T_3 excess and deficiency
 - 6. Hyperparathyroidism (primary and secondary)
 - 7. Hypoparathyroidism
- I. Alterations of adrenal function (cortex and medulla)**
 - 1. Cushing's syndrome
 - 2. Addison's disease

- 3. Aldosteronism and primary hyperaldosteronism
- 4. Androgen excess/virilization (adrenal-genital hyperplasia)
- 5. Pheochromocytoma
- 6. Drug-induced alteration (for example: steroids)

- J. Female reproductive system**
 - 1. Endometriosis
 - 2. Amenorrhea/dysmenorrhea
 - 3. Leiomyomas
 - 4. Fibrocystic breast disease
 - 5. Infertility
 - 6. Ovarian cysts
- K. Male reproductive system**
 - 1. Hypogonadism
 - 2. Cryptorchidism
 - 3. Benign prostatic hyperplasia
 - 4. Infertility

VIII. Clinical Applications Related to the Various Systems

10 PERCENT OF EXAM

Copstead

[Review all Units already cited](#)

A. Signs and symptoms (patient clinical presentation)

Pain — significance for all systems

Jaundice — significance for GI, etc.

B. Diagnostic studies, including normal values

For hematology — transfusion reaction

For cardiovascular — cardiac enzymes

For renal — urinalysis

For GI, etc. — direct and indirect bilirubin, amylase, lipase, liver enzymes, blood sugar, hormones

For neurology, etc. — Glasgow Coma Scale, brain stem function

C. Treatment

For hematology— blood transfusion,
anti-coagulation therapy,
thrombolytic therapy

For respiratory— bronchodilators

For cardiovascular— lifestyle
modification, diet, exercise

For renal— fluid intake, dialysis

For GI, etc.— H₂ blockers,
Pepto-Bismol

For neurology, etc.— hormone
replacement therapy, calcium
supplements

SECTION THREE

Sample Questions

The sample questions give you an idea of the level of knowledge expected in the exam and how questions are typically phrased. They are not representative of the entire content of the exam and are not intended to serve as a practice test.

Rationales for the questions can be found on pages 26–31 of this guide. In that section, the correct answer is identified and each answer is explained. The number in parentheses at the beginning of each rationale refers to the corresponding section of the content outline. For any questions you answer incorrectly, return to that section of the content outline for further study.

1. What process occurs in endocrine-dependent organs when hormonal stimulation decreases?
 - 1) atrophy
 - 2) dysplasia
 - 3) hyperplasia
 - 4) hypertrophy
2. Which cells are capable of hyperplastic growth?
 - 1) cardiac muscle
 - 2) epithelial
 - 3) nerve
 - 4) skeletal muscle
3. A patient with carrier status for cystic fibrosis marries another person with carrier status for the disease. What are the consequences for the children of this couple?
 - 1) All of their children will be carriers.
 - 2) Some of their children will have the disease, others will carry the trait, and others will not have the disease.
 - 3) All of their children will either carry the trait or present with the disease.
 - 4) None of the children will be affected, as the disorder skips every other generation.
4. Why are corticosteroids used to treat skin disorders such as seborrheic dermatitis?
 - 1) to reduce inflammation
 - 2) to minimize pain
 - 3) to enhance collagen production
 - 4) to prevent infection
5. Which factor is related to a high incidence of malignant melanoma?
 - 1) steroid hormone activity
 - 2) excess solar radiation
 - 3) long-term antibiotic use
 - 4) fungal infection
6. Hyperthyroidism, an enlarged thyroid gland, and exophthalmos are symptoms associated with which disorder?
 - 1) myxedema
 - 2) myasthenia gravis
 - 3) Hashimoto's disease
 - 4) Graves' disease
7. Angioedema, bronchial wheezing, and cutaneous itching within minutes of exposure to an allergen are typical of which type of hypersensitivity reaction?
 - 1) type I: anaphylactic
 - 2) type II: cytotoxic
 - 3) type III: immune complex
 - 4) type IV: delayed

8. What is the major distinguishing characteristic of Mobitz type I (Wenckebach) second degree heart block?
 - 1) Impulses are not conducted from the atria to the ventricles and a ventricular escape rhythm is present.
 - 2) P waves are nonconducted and there is a consistent P-R interval.
 - 3) There is a prolonged P-R interval, but each P wave is associated with a QRS complex.
 - 4) There is a progressively lengthening P-R interval until one P wave is not conducted.
9. Preload, afterload, contractility, and heart rate affect which action in the cardiovascular system?
 - 1) cardiac cycle
 - 2) myocardial conduction
 - 3) cardiac output
 - 4) atrial systole
10. What congenital circulatory problem results in the bypassing of the lungs and the recirculating of blood into the pulmonary circuit?
 - 1) patent foramen ovale
 - 2) ventricular septal defect
 - 3) transposition of the great arteries
 - 4) atrioventricular septal defect
11. Chest pain, friction rub, and serial electrocardiogram (ECG) abnormalities are found in which disorder?
 - 1) myocardial infarction
 - 2) angina pectoris
 - 3) cardiac tamponade
 - 4) acute pericarditis
12. Chronic dilation of the medium-sized bronchi and bronchioles is most likely to be associated with which disease?
 - 1) bronchiectasis
 - 2) emphysema
 - 3) chronic bronchitis
 - 4) cystic fibrosis
13. What is the primary mode of transmission of tuberculosis (TB)?
 - 1) airborne droplets
 - 2) contaminated blood
 - 3) fecal-oral contamination
 - 4) sexual contact
14. Which is an accurate statement regarding extracellular fluid volume deficit?

It is the result of

 - 1) addition of sodium into the body.
 - 2) removal of a sodium-containing fluid from the body.
 - 3) excessive aldosterone secretion in the body.
 - 4) inadequate sodium and water losses from the body.
15. What blood test results are consistent with a diagnosis of respiratory acidosis?
 - 1) PaO₂ 65 mm Hg; PaCO₂ 58 mm Hg; pH 7.1; anion gap 8 mEq/L
 - 2) PaO₂ 99 mm Hg; PaCO₂ 25 mm Hg; pH 7.2; anion gap 25 mEq/L
 - 3) PaO₂ 100 mm Hg; PaCO₂ 29 mm Hg; pH 7.7; anion gap 10 mEq/L
 - 4) PaO₂ 94 mm Hg; PaCO₂ 50 mm Hg; pH 7.5; anion gap 7 mEq/L
16. Which of the following can be expected in the late stages of chronic renal failure when the glomerular filtration rate (GFR) declines to 25%?
 - 1) hypocalcemia and phosphaturia
 - 2) hypercalcemia and decreased calcium deposition
 - 3) hypocalcemia and phosphate retention in kidneys
 - 4) hypercalcemia and decreased serum calcium levels
17. A painless chancre is the most common symptom associated with which urogenital disorder?
 - 1) chlamydia
 - 2) gonorrhea
 - 3) syphilis
 - 4) nonspecific urogenital infection

18. Which signs and symptoms are indicative of autonomic dysreflexia (autonomic hyperreflexia)?
- 1) tachycardia, hyperthermia, and urticaria, with pain and spasm below the level of the lesion
 - 2) hypoventilation and absence of deep tendon reflexes, with bilateral flaccid paralysis below the level of the lesion
 - 3) hypotension, hypothermia, and paresthesia, with pallor and goose bumps above the level of the lesion
 - 4) hypertension, bradycardia, and severe headache, with sweating and flushing of the skin above the level of the lesion
19. By what mechanism are pain-reducing measures such as acupuncture and transcutaneous electrical nerve stimulation (TENS) thought to alleviate pain?
- 1) They inhibit the release of endogenous opioids and enkephalins.
 - 2) They are morphine antagonists that moderate pain.
 - 3) They stimulate the release of substance P.
 - 4) They close the pain gate and recruit large fibers.
20. Which joint structure is involved in the initial stage of degenerative joint disease?
- 1) synovial membrane
 - 2) articular cartilage
 - 3) epiphyseal plate
 - 4) joint cavity
21. What factor causes exacerbation of a sliding hiatal hernia?
- 1) an increase in intrathoracic pressure
 - 2) an increase in intra-abdominal pressure
 - 3) a decrease in intra-abdominal pressure
 - 4) a decrease in intrathoracic pressure
22. What is the primary damage seen with gluten intolerance (celiac disease)?
- 1) edema of the mucous membrane
 - 2) hyperplasia of lymphoid tissue
 - 3) atrophy or loss of epithelial villi
 - 4) increased cell production
23. Which treatment is recommended for the syndrome of inappropriate antidiuretic hormone secretion (SIADH)?
- 1) administration of hypotonic saline
 - 2) infusion of 0.9% saline
 - 3) injection of posterior pituitary extract
 - 4) restriction of fluid intake
24. Which laboratory test result would indicate thyroid hypofunction?
- 1) low levels of ACTH
 - 2) high levels of T_4 and T_3
 - 3) low levels of parathyroid hormone
 - 4) high levels of TSH
25. Avoidance of caffeine is typically recommended for individuals with which pair of disorders?
- 1) ovarian cysts and endometriosis
 - 2) mastitis and amenorrhea
 - 3) fibrocystic breast disease and premenstrual syndrome
 - 4) pelvic inflammatory disease and leiomyomas
26. Which disease is most likely to be diagnosed in a 37-year-old individual who presents with joint pain, fever, morning stiffness, proteinuria, and a red rash across the bridge of the nose and cheeks?
- 1) gout
 - 2) rheumatoid arthritis
 - 3) systemic lupus erythematosus
 - 4) ankylosing spondylitis
27. Which arterial blood gas result indicates that a patient is hyperventilating?
- 1) pH 7.32, $PaCO_2$ 45, PaO_2 82, HCO_3^- 20
 - 2) pH 7.48, $PaCO_2$ 30, PaO_2 98, HCO_3^- 22
 - 3) pH 7.20, $PaCO_2$ 60, PaO_2 60, HCO_3^- 27
 - 4) pH 7.51, $PaCO_2$ 52, PaO_2 95, HCO_3^- 33
28. What is the ultimate goal of treatment for hepatic encephalopathy?
- 1) to decrease urea production
 - 2) to eliminate carbohydrate intake
 - 3) to reduce serum ammonia level
 - 4) to prevent secondary infection

Content Chart for Specific Topics

The following content chart is organized so that topics associated with broad content areas are grouped together. For example, topics related to neoplasia are grouped together so that you can study general concepts about tumors and then proceed to more detailed concepts about specific tumors.

In general, the content chart is intended to complement the presentation of the material in the Recommended Textbook. The listed topics can be studied in conjunction with and/or at about the same point as the associated topic is presented in the Copstead textbook.

Topic	McCance & Huether (7th ed. 2014)	Porth & Matfin (9th ed., 2014)
Neoplasia Tumor Markers	p. 365, Table 12-3 (369)	pp. 160-189
Mechanisms of Metastasis	pp. 387-392 Table 12-8 (391)	pp. 168-172
Angiogenesis	p. 381	pp. 173, 177-178, 319-320
Neoplasia Nomenclature	pp. 364-368, Table 12-2 (367)	pp. 166-167, Table 8-1 (167)
Lung Cancers	pp. 1279-1283, Table 35-4 (1281)	pp. 945-948
Brain Cancers	pp. 626-634, Table 18-4 (627)	pp. 516-519
Musculoskeletal Cancers (Rhabdomyosarcoma)	pp. 1585-1586, 1611-1613 (in relation to a child)	pp. 1465-1469 Table 8-1 (167)
Oral and Laryngeal Cancers	pp. 1278-1249	p. 181
Paraneoplastic Syndromes (Hormone Expression, etc.)	p. 394 Table 12-11 (395)	pp. 185-186
Systemic Lupus Erythematosus	pp. 277-278	pp. 355-357, 1104-1105, 1505-1509, 1520-1522
Wound Healing	pp. 215-220	pp. 321-326
Pelvic Inflammatory Disease	pp. 813-816	p. 1394-1395
Fractures and Fracture Repair	pp. 1540-1545, Table 44-1 (1542)	pp. 23, 1451-1455, 1493-1494
Irritable Bowel Syndrome	pp. 1440-1444 Table 14-5 (1443)	p. 1184
Crohn's Disease	pp. 1442-1444	pp. 1184-1190

Topic	McCance & Huether (7th ed. 2014)	Porth & Matfin (9th ed., 2014)
Ulcerative Colitis	pp. 1440–1442	pp. 1184–1190
Peptic Ulcer Disease: Gastric and Duodenal Ulcers	pp. 1435–1439	pp. 1180–1182
Lactose Intolerance: Treatment	pp. 1439–1440	p. 911, 1166–1167
Sprue	pp. 1494–1497 (gluten-sensitive enteropathy)	Indexed as "celiac disease" pp. 1199–1201
Use of Corticosteroids	multiple indexed references	multiple indexed references
Diabetes: Causes of Death	pp. 735–752	pp. 1327–1329
Common Lab Values	Inside back cover	appendix A pp. 1585–1586
Bilirubin (Direct and Indirect)	pp. 86–87, 1411–1412 Table 40–6 (1417)	pp. 22, 668–669, 1215–1217
Interpretation of Blood Gases	Table 34–4 (1245)	pp. 919–924
Acid-Base Disorders and Interpretation of Lab Values	pp. 126–131	pp. 1071–1081
Plasma Proteins	pp. 945–947 Inside back cover	pp. 239, 675, 733–735, 1024–1025
Cardiac Isoenzymes	p. 1161	p. 804–805
Chart of Coagulation (Clotting) Factors	Table 25–7 (970)	pp. 651–654 Table 26.3 (651)
Assessment Signs: Kernig's sign Brudzinski's sign Homans' sign Trousseau's sign Chvostek's sign	p. 606 p. 606 Not indexed p. 120 p. 120	p. 515–516 p. 515–516 Not indexed pp. 1051–1052 pp. 1057–1058
Influenza	pp. 320–322	pp. 932–934
Lyme Disease	pp. 617–618, 1640	pp. 259, 264–266
Hepatitis	pp. 1457–1460	pp. 1220–1225
Schedule of Vaccinations and Immunizations	not indexed	pp. 28–29, 272, 376
Nephritic and Nephrotic Syndromes	pp. 1352–1359 (under glomerulonephritis), Table 38–7 (1356)	pp. 334, 1100–1103, 1506

Topic	McCance & Huether (7th ed. 2014)	Porth & Matfin (9th ed., 2014)
Relation of Creatine Kinase to Muscular Dystrophy	Table 45-4 (1606)	p. 462
Head Injury (Concussion, etc.)	pp. 581-589	pp. 503-505
Intracranial Pressure	pp. 555-557	pp. 496-500, 737
Coma	pp. 527-550 Table 17-3 (529)	pp. 491-493 Table 51-5
Epilepsy	pp. 550-555	pp. 519-521
Seizure classification	Box 17-2 (554)	Chart 20.1, pp. 520-521
Pain	pp. 485-495	pp. 430-448
Pain Relief: Acupuncture, Transcutaneous Electrical Nerve Stimulation	Not indexed	pp. 448-450

SECTION FOUR

Rationales

1.(IA1)

- *1) Atrophy refers to the decrease in the size of cells and their differentiated functions. An example is endocrine atrophy which occurs when endocrine signals are interrupted or when hormonal support is withdrawn.
- 2) Dysplasia refers to the disorganized appearance of cells due to abnormal size, shape, and arrangement.
- 3) Hyperplasia refers to an increase in the number of cells within a tissue, leading to an increase in the size of the tissue or organ. An example is enlargement of breast tissue during pregnancy or lactation.
- 4) Hypertrophy refers to an increase in cell mass leading to enlargement of a tissue. It is stimulus-related and an adaptive response. An example is thickening of the myocardium of the ventricular wall.

2.(IA3)

- 1) Cardiac cells demonstrate an increase in size, not in the number of cells.
- *2) Hyperplastic growth is dependent upon mitotic cell division which increases the number of cells. This is most often seen in epithelial tissues.
- 3) Hyperplastic growth is not seen in nerve cells.
- 4) Skeletal muscle cells demonstrate an increase in size, not in the number of cells.

3.(IC2)

- 1) The mating of two carriers (heterozygous) results in a two-in-four chance of producing an offspring who carries the disease. It is possible, therefore, that not all the children will be carriers.
- *2) Cystic fibrosis is an autosomal recessive disorder. The mating of two carriers (heterozygous) results in a one-in-four chance of producing an offspring affected with the disorder, and a two-in-four chance of producing an offspring who carries the disease. The chance of having an offspring who is neither a carrier nor is affected with the disorder is one-in-four.
- 3) It is possible to have an offspring who is neither a carrier nor is affected with the disorder.
- 4) There is a one-in-four chance of having an offspring who is affected with the disorder.

4.(IIA2)

- *1) Corticosteroids promote healing in skin disorders by suppressing inflammation and reducing erythema, edema, and pruritis.
- 2) Corticosteroids reduce the pruritis associated with some skin disorders but have no analgesic effect. Antipyretics, such as acetaminophen, are often used to relieve local discomfort of skin disorders.
- 3) Corticosteroids inhibit collagen formation.
- 4) Treatment with corticosteroids impairs the immune response and increases the risk of infection.

*correct answer

5.(IIA2)

- 1) There is no documented evidence that steroid hormone activity leads to malignant melanoma.
- *2) The increased incidence of malignant melanoma is attributed to greater sun exposure. An increased frequency of malignant melanoma in the Sunbelt States of the US supports the role of ultraviolet (UV) light as a cause of this tumor.
- 3) Long-term antibiotic therapy is not associated with malignant melanoma.
- 4) There is no correlation between fungal skin infections and the incidence of malignant melanoma.

6.(IID3)

- 1) Myxedema (advanced hypothyroidism) is characterized by facial puffiness, nonpitting edema, and altered mental state.
- 2) Myasthenia gravis, an autoimmune neuromuscular disorder, is characterized by diplopia, ptosis, increasing weakness with activity, and possible respiratory failure.
- 3) Hashimoto's disease (lymphocytic thyroiditis) is characterized by an enlarged thyroid gland.
- *4) Graves' disease is characterized by hyperthyroidism, thyromegaly (goiter), thyrotoxicosis, and exophthalmos.

7.(IID4)

- *1) Anaphylactic reactions (type I hypersensitivity) are associated with angioedema, bronchial wheezing, and cutaneous itching.
- 2) Cytotoxic reactions (type II hypersensitivity) occur in transfusion reactions and hemolytic disease of the newborn.
- 3) Immune complex reactions (type III hypersensitivity) are seen in serum sickness, arthritis, and vasculitis.
- 4) Delayed hypersensitivity (type IV) develops over time and is seen in Guillain-Barré syndrome and contact dermatitis.

8.(IIIA5)

- 1) This pattern describes third degree or complete heart block.
- 2) This pattern describes Mobitz type II second degree heart block.
- 3) This pattern describes first degree heart block.
- *4) This pattern describes Mobitz type I (Wenckebach type I) second degree heart block.

9.(IIIC1)

- 1) The cardiac cycle refers to the repetitive contraction and relaxation of the heart muscle.
- 2) Myocardial conduction refers to the conduction of the electrical impulse in the myocardium.
- *3) Preload, afterload, contractility, and the heart rate are hemodynamic parameters that influence cardiac output.
- 4) Atrial systole is atrial contraction.

10.(IIIF1)

- 1) The foramen ovale refers to the opening between the two atria of the heart in the fetus. It normally closes shortly before or after birth. If it remains open or patent, it is referred to as an atrial septal defect.
- 2) A ventricular septal defect occurs in the septum between the left and right ventricle. It permits blood to flow from the left to the right ventricle and to recirculate through the pulmonary artery and the lungs.
- *3) Transposition of the great arteries is a fetal anomaly in which the aorta arises from the right ventricle and the pulmonary artery arises from the left ventricle, and there is no communication between the systemic and pulmonary circulations.
- 4) In atrial septal defect there is an abnormal opening between the atria that increases the flow of oxygenated blood into the right side of the heart. In ventricular septal defect, there is an opening below the septum that separates the ventricles and permits blood to flow from the left to the right ventricle and to recirculate through the pulmonary artery and the lungs.

*correct answer

11.(III G2)

- 1) Myocardial infarction is characterized by chest pain and serial ECG abnormalities. Friction rub is not present.
- 2) Angina pectoris is characterized by chest pain associated with intermittent myocardial ischemia. Transient ECG changes occur. Friction rub is not present.
- 3) Cardiac tamponade caused by an accumulation of pericardial fluid results in external compression of the heart chambers reducing stroke volume. Clinical manifestations include dull chest pain, diminished ECG amplitude, and muffled heart sounds. Pericardial friction rub is not present.
- *4) Acute pericarditis is characterized by chest pain, friction rub, and ECG abnormalities. Systemic effects of inflammation and pericardial damage lead to stretching and rubbing of the visceral and pericardial layers.

12.(IV A2)

- *1) Bronchiectasis is characterized by recurrent infection and inflammation of bronchial walls which leads to persistent dilation of bronchi and bronchioles.
- 2) Emphysema is characterized by destructive changes in the alveolar walls with enlargement of the distal air sacs.
- 3) Chronic bronchitis is defined as hypersecretion of the bronchial mucosa with a production cough for greater than three months.
- 4) Cystic fibrosis is an autosomal recessive disorder of the exocrine glands that is characterized by the production of an abnormally thick obstructive mucus.

13.(IV F3)

- *1) Since the most common site of infection with tuberculosis is the lungs, transmission occurs from the inhalation of contaminated droplets produced when an infected person coughs or sneezes.
- 2) Contaminated blood can transmit diseases such as hepatitis and HIV.
- 3) Fecal-oral contamination can transmit diseases such as salmonella and E.coli food poisoning.
- 4) Sexual contact can transmit diseases such as gonorrhea, herpes simplex, trichomonas, and HIV.

14.(V A2)

- 1) Addition or retention of sodium leads to the development of fluid volume excess.
- *2) The removal of a sodium-containing fluid from the body leads to extracellular fluid volume deficit.
- 3) Excess aldosterone secretion would promote sodium retention leading to the development of fluid volume excess.
- 4) Inadequate excretion of sodium and water would promote fluid volume excess.

15.(V C1)

- *1) A pH below normal (7.35–7.45) and PaCO₂ above normal (35–45 mm Hg) indicates primary respiratory acidosis. Anion gap 8 mEq/L is within normal limits (less than 15 mEq/L), thus eliminating metabolic acidosis. PaO₂ 65 mm Hg represents hypoxemia.
- 2) Although pH 7.2 represents acidosis, the elevation of the anion gap to 25 mEq/L indicates metabolic acidosis. The decrease in PaCO₂ indicates partial compensation since the lungs will hyperventilate to eliminate excessive carbonic acid in an attempt to restore the pH to normal.
- 3) Elevated pH (greater than 7.35–7.45) and decreased PaCO₂ indicates respiratory alkalosis. The normal anion gap indicates no metabolic acidosis component.
- 4) Although the PaCO₂ is elevated, the presence of pH 7.5 indicates an alkalotic abnormality.

*correct answer

16.(VE2)

- 1) As renal disease advances and GFR falls to about 25% of normal, phosphate is retained by the kidneys. Phosphate retention does cause the depression of serum calcium levels, but there will be decreased phosphate excretion by the kidneys.
- 2) Phosphate retention causes depression of serum calcium levels and interference with vitamin D3 activation by the kidneys. As renal function decreases, low serum calcium and high phosphate levels stimulate parathyroid activity resulting in bone resorption of calcium and phosphate.
- *3) As renal disease advances, there is progressive disruption of calcium phosphate interrelations. Phosphate is retained when the GFR declines to 25%. There are decreased serum calcium levels secondary to phosphate retention and interference with vitamin D3 activation by the kidneys.
- 4) With advancing renal disease, phosphate retention causes depression of serum calcium levels or hypocalcemia

17.(VG2)

- 1) Chlamydia typically produces discharge.
- 2) Gonorrhea typically produces purulent discharge and painful urination.
- *3) During the early stages of syphilis, a painless ulcerative lesion, or chancre, develops at the site of entry of the spirochete.
- 4) Nonspecific urogenital infections typically produce inflammation and pain.

18.(VIA2)

- 1) Tachycardia, hyperthermia, urticaria, with pain and spasm below the level of the lesion are not associated with autonomic dysreflexia.
- 2) Flaccid paralysis of all skeletal muscles and absence of deep tendon reflexes are associated with spinal shock. Hypoventilation occurs with spinal cord injury above C5.
- 3) After a complete spinal cord injury, paresthesia occurs below the level of injury. Hypotension is a symptom of spinal shock. In autonomic dysreflexia, pallor and goose bumps occur below the level of the lesion.
- *4) Hypertension, bradycardia, and severe headache, with sweating and flushing of the skin above the level of the lesion are symptoms typical of autonomic dysreflexia. The stimulus that triggers autonomic dysreflexia is often a full bladder.

19.(VIG4)

- 1) Endogenous opioids and enkephalins decrease the pain response. Anything that interferes with or inhibits their action would not relieve pain.
- 2) Morphine antagonists would increase the awareness of painful sensations.
- 3) Substance P is a neuropeptide that promotes pain transmission.
- *4) The effect of acupuncture and TENS can be explained by the gate control theory which suggests that large fiber stimulation decreases the pain response.

20.(VIH2)

- 1) Synovitis or inflammation of the synovial membrane is seen later in the degenerative disease process.
- *2) Since articular cartilage has a limited capacity for repair and regeneration, trauma or stress can predispose the development of degenerative joint disease.
- 3) The epiphyseal plate or growth plate is not affected in degenerative joint disease.
- 4) Alterations in the joint cavity occur later in the degenerative disease process.

*correct answer

21.(VIIA4)

- 1) An increase in intrathoracic pressure would prevent the hernia from sliding upward.
- *2) An increase in intra-abdominal pressure, such as assuming a supine position, disrupts the competency of the gastroesophageal junction causing it to slide above the diaphragm into the thoracic cavity.
- 3) A decrease in intra-abdominal pressure would not be associated with an exacerbation of a hiatal hernia.
- 4) A decrease in intrathoracic pressure would have no effect on a hiatal hernia.

22.(VIIB2)

- 1) The mucosa of the small intestine appears flat in celiac disease. Mucous membrane edema is seen in inflammatory processes.
- 2) Hyperplasia of lymphoid tissue is not associated with celiac disease.
- *3) Celiac disease is characterized by defects in metabolism as a result of gluten intolerance. There is damage to the surface epithelium of the small intestine and atrophy of the villi.
- 4) Increased cellular production of gastric secretions can promote peptic ulcer disease.

23.(VIIG5)

- 1) Administration of hypotonic saline would exacerbate the hyponatremia and fluid volume overload associated with SIADH.
- 2) Infusion of 0.9% sodium chloride isotonic solution may be used to raise the serum sodium level, but it may not be sufficient enough to treat the severe hyponatremia associated with SIADH.
- 3) Antidiuretic hormone is secreted from the posterior pituitary gland. Administration of posterior pituitary extract would exacerbate the clinical situation.
- *4) Fluid restriction is the treatment for SIADH. This treatment should result in a loss of body weight and an increase in serum osmolality.

24.(VIH5)

- 1) Low levels of ACTH indicate adrenocortical hyperfunction.
- 2) High levels of T_4 and T_3 indicate hyperthyroidism.
- 3) Low levels of parathyroid hormone indicate parathyroid hypofunction.
- *4) TSH, thyroid-stimulating hormone, is elevated in thyroid hypofunction.

25.(VIIJ)

- 1) There is no evidence that avoiding caffeine has any effect on individuals with ovarian cysts or endometriosis.
- 2) Avoiding caffeine is not typically included in the treatment of mastitis or amenorrhea.
- *3) The methylxanthines, including the related alkaloid caffeine, increase metabolic activity in the breast. Decreasing caffeine in the diet has been effective in helping to alleviate breast tenderness and pain associated with fibrocystic breast disease and premenstrual syndrome (PMS). In addition, women with PMS are advised to avoid stimulants, such as caffeine, to help alleviate symptoms associated with anxiety.
- 4) Avoiding caffeine is not included in the treatment of pelvic inflammatory disease and leiomyomas.

26.(VIII A)

- 1) Gout is a metabolic disorder that is associated with deposition of uric acid in bony and connective tissues.
- 2) Rheumatoid arthritis is an inflammatory disorder of the joints and synovial tissues.
- *3) Joint pain, fever, morning stiffness, proteinuria, and a red rash across the bridge of the nose and cheeks are symptoms of systemic lupus erythematosus, an autoimmune disorder that effects multiple organ systems.
- 4) Ankylosing spondylitis involves the entire spine. There is morning stiffness with marked limitation of motion. There is no associated fever or facial rash.

*correct answer

27.(VIII B)

- 1) Decreased pH and decreased HCO_3^- indicate an uncompensated metabolic acidosis. PaCO_2 45 is normal and indicates that the patient is not yet hyperventilating as a compensatory mechanism to restore the pH to normal.
- *2) Elevated pH 7.48 and decreased PaCO_2 30 indicates respiratory alkalosis. Hyperventilation is a cause of this acid-base imbalance.
- 3) PaCO_2 60 and pH 7.20 indicate respiratory acidosis. Elevated PaCO_2 indicates alveolar hypoventilation leading to retention of CO_2 . PaO_2 60 indicates hypoxemia.
- 4) Elevated pH 7.51 and elevated HCO_3^- 33 indicate metabolic alkalosis. PaCO_2 52 indicates the lungs are compensating by retaining CO_2 through hypoventilation in an attempt to restore the pH to normal.

28.(VIII C)

- 1) Urea levels are decreased in liver disease.
- 2) A high-carbohydrate diet is given to provide the patient with calories. Protein is restricted to inhibit its breakdown into ammonia.
- *3) Reduction of serum ammonia levels is essential in the treatment of hepatic encephalopathy to slow its progression. Treatment to eliminate ammonia-producing substances from the GI tract includes administering neomycin and lactulose and reducing dietary protein intake.
- 4) Prevention of secondary infection is important since it can precipitate hepatic encephalopathy by increasing tissue metabolism which increases ammonia production; however, it is not the ultimate goal of treatment.

*correct answer

SECTION FIVE

Taking the Exam

Registering for Your Exam

Register Online

www.excelsior.edu/examregistration

Follow the instructions and pay by Visa, MasterCard, American Express, or Discover Card.

Examination Administration

Pearson Testing Centers serve as the administrator for all Excelsior College computer-delivered exams.

Accessibility Services

Excelsior College is committed to the principle that every individual should have an equal opportunity to enroll in an Excelsior College degree program, to register for courses or examinations in order to demonstrate their knowledge and skills under appropriate conditions, and to complete a degree.

The Accessibility Services Office at Excelsior College is responsible for considering requests for reasonable accommodations for individuals with verifiable, documented disabilities. If you are requesting an accommodation due to a disability/condition, complete a [Request for Accommodation form](#).

Computer-Delivered Testing

The UExcel exams are delivered by computer. You can take this exam either in a [Pearson VUE testing center](#) or at your home or office with an online proctor. If you are interested in remote proctoring, visit [PearsonVUE OnVUE online proctoring](#).

The system is designed to be as user-friendly as possible, even for those with little or no computer

experience. On-screen instructions are similar to those you would see in a paper examination booklet. You will use either the keyboard or the mouse to submit your answers, depending upon the type of question.

Before taking your exam, we strongly encourage you to go on a virtual tour of the testing center. To access this tour, click the What to Expect in a Pearson VUE test center at the following link: home.pearsonvue.com/test-taker/security.aspx

You also will receive a small, erasable whiteboard if you need one.

Breaks

Breaks are only permitted for exams taken at Pearson VUE Testing Centers, and are not permitted during exams delivered via online proctoring.

Online Proctoring

As of spring 2021, Excelsior is offering an [online delivery option for UExcel exams](#), using OnVUE, Pearson VUE's online delivery and proctoring service.

You must use a personal (vs. an employer's) computer if you want to take the exam online and not in a testing center, so the exam can be effectively delivered to you.

Breaks are not allowed during an exam taken online from home. You may not leave your seat during an online-proctored exam, so be prepared to sit for two or three hours. If you need extra time, the exam will have to be taken at a PearsonVUE Testing Center, and an accommodation formally requested.

NOTE: English Composition, Spanish, Music, and College Writing will NOT be available for online proctoring.

On the Day of Your Exam

Important Reminders

On the day of your exam, remember to:

- dress comfortably: the computer will not mind that you're wearing your favorite relaxation outfit
- arrive at the test site rested and prepared to concentrate for an extended period
- allow sufficient time to travel, park, and locate the test center
- be prepared for possible variations in temperature at the test center due to weather changes or energy conservation measures
- bring your ID, but otherwise, don't weigh yourself down with belongings that will have to be kept in a locker during the test.

Academic Integrity Nondisclosure Statement

- All examinees must agree to the terms of the Excelsior College Academic Integrity Policy before taking an examination. The agreement will be presented on screen at the Pearson VUE Testing Center before the start of your exam.
- Once the examinee agrees to the terms of the Academic Integrity Nondisclosure Agreement (NDA), the exam will begin.

If you choose not to accept the terms of the agreement

- your exam will be terminated
- you will be required to leave the testing center
- you will not be eligible for a refund. For more information, review the Student Policy Handbook at www.excelsior.edu/studentpolicyhandbook.

Student behavior is monitored during and after the exam. Electronic measures are used to monitor the security of test items and scan for illegal use of intellectual property. This monitoring includes surveillance of Internet chat rooms, websites, and other public forums.

UExcel Grade Report

After you complete the exam, you will be issued a UExcel Grade Report for Examinations. See the [sample UExcel Grade Report](#) in this content guide.

Grade Appeals

If you believe that your score grade is incorrect, you may appeal your grade to examcredit@excelsior.edu. Details about the appeals process are in the [Student Handbook](#).

What If I Miss My Appointment?

If you don't cancel or reschedule your testing appointment 24 hours before your test appointment, you will have to pay the full fee of the exam, even if you don't show up.

Late Arrivals

You will also forfeit the exam fee if you arrive to the test center more than 15 minutes late.

Information About UExcel Exams for Colleges and Universities

A committee of teaching faculty and practicing professionals determines the learning outcomes to be tested on each exam. Excelsior College Center for Educational Measurement staff oversee the technical aspects of test construction in accordance with current professional standards. To promote fairness in testing, we take special care to ensure that the language used in the exams and related materials is consistent, professional, and user friendly. Editorial staff perform systematic quantitative and qualitative reviews to ensure accuracy, clarity, and compliance with conventions of bias-free language usage.

Excelsior College, the test developer, recommends granting three (3) semester hours of upper-level undergraduate credit to students who receive a letter grade of C or higher on this examination. Other colleges and universities also recognize this exam as a basis for granting credit or advanced standing. Individual institutions set their own policies for the amount of credit awarded and the minimum acceptable score.

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Sample Grade Report

Excelsior College
GRADE REPORT FOR EXAMINATIONS

<p>Contact ID:</p> <p>Test Date: 11/21/2020</p> <p>Letter Grade: C</p> <p>Examination Code and Title: 210 Statistics</p> <p>Recommended Credit: 3 Lower Level</p>

Your examination results are expressed as a Letter Grade of A, B, C, or F. Your results are automatically verified when they are received at Excelsior College. If an error is detected, you will be notified immediately.

Recommended Credit is the number of semester hours credit that Excelsior College awards and recommends for your grade. Excelsior College awards and recommends credit for letter grades of C or better.

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