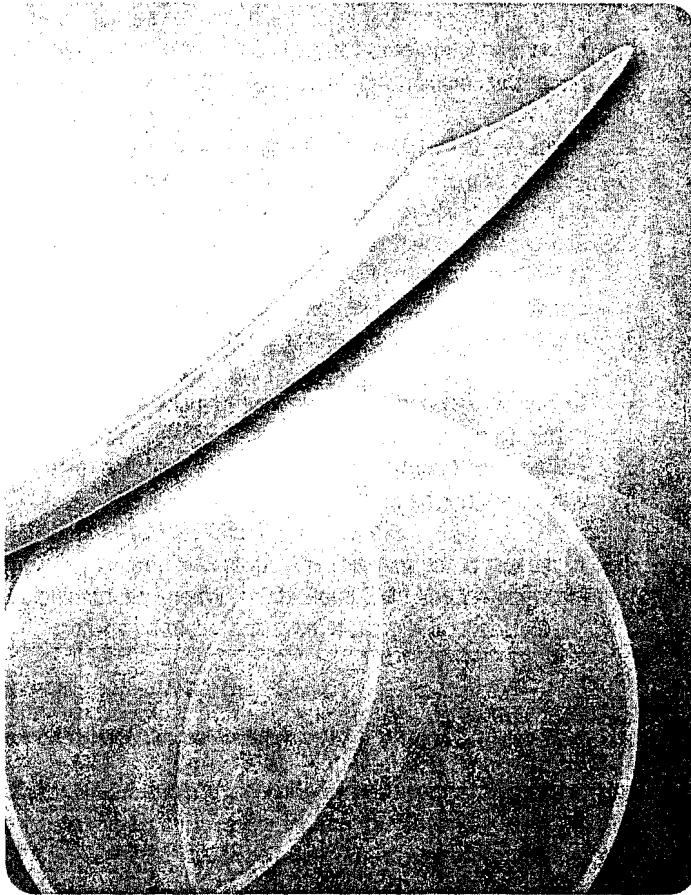


PMP" Exam Prep



**Accelerated Learning
to Pass PMI's PMP Exam —
On Your FIRST Try!**

Rita Mulcahy, PMP



Table of Contents

Introduction to the Fifth Edition of PMP Exam Prep	vii
Chapter 1: The PMP Exam	
Why Take the PMP Exam?	1
Are You Ready for the PMP Exam?	1
How to Use This Book	2
Other Materials to Use to Study for the PMP Exam	4
How to Study for the PMP Exam	6
Your Step-by-step Study Plan	6
Qualifying to Take the Exam	8
Applying to Take the Exam	8
What Is the PMP Exam Like?	9
On Exam Day	12
Tricks for Taking the PMP Exam	12
Recurring Themes—PMI-isms to Know for the PMP Exam	16
Common Project Management Errors and Pitfalls	20
Chapter 2: Project Management Framework	21
Practice Exam	32
Chapter 3: Project Management Processes	37
Rita's Process Chart	38
Rita's Process Game	40
Practice Exam	80
Chapter 4: Integration Management	85
Rita's Process Chart—Integration Management	86
Project Charter	88
Practice Exam	108
Chapter 5: Scope Management	123
Rita's Process Chart—Scope Management	124
Practice Exam	136
Chapter 6: Time Management	143
Rita's Process Chart—Time Management	144
Practice Exam	183
Chapter 7: Cost Management	197
Rita's Process Chart—Cost Management	198
Practice Exam	218
Time and Cost Game	230
Chapter 8: Quality Management	235
Rita's Process Chart—Quality Management	236
Practice Exam	254
Chapter 9: Human Resource Management	265
Rita's Process Chart—Human Resource Management	266
Practice Exam	290



Chapter 10: Communications Management	301
Rita's Process Chart— Communications Management	302
Practice Exam	314
Chapter 11: Risk Management	325
Rita's Process Chart— Risk Management	326
Practice Exam	353
Chapter 12: Procurement Management	365
Rita's Process Chart— Procurement Management	366
Practice Exam	399
Chapter 13: Professional and Social Responsibility	411
Rita's Process Chart— Professional and Social Responsibility	412
PMI's PMP® Code of Professional Conduct	424
Practice Exam	425
Appendix	437
Index	439

Introduction to the Fifth Edition of PMP Exam Prep

by Rita Mulcahy, PMP

Thank you for purchasing the latest edition of the original PMP Exam prep book, which paved the way for accelerated learning in the industry. Our materials have been used in more than 40 countries as the primary tool for passing the exam since we created the PMP exam prep book market in 1998.

I am glad that you chose to let us help you get ready for the exam faster, and without focusing on memorization. I have enjoyed coming up with devilish ways for you to get ready for the exam faster and easier. I hope you enjoy this edition!

I have a particular aversion to using memorization to pass an exam, don't you? That is why this book is full of learning, not memorization. The funny thing is that while others force you to memorize, you can actually spend the same amount of time learning instead and pass the exam.

After working with thousands of people, I have perfected what my students say is the most efficient and shortest process for studying for the exam! You should not need to study more than 120 hours using our products if you have had project management training.

Although you will certainly learn a lot about project management, this book is not designed to teach you all you need to know about how to manage a project, or the art and science of project management. You must have project management training before you take the exam.

In order to get the most out of your efforts and save time studying, this book has been specifically designed to accomplish the following:

- Help you learn, not just memorize
- Focus you on the areas where others commonly score the worst
- Help you determine your knowledge gaps
- Provide insider tips about the exam that are not readily available elsewhere
- Review topics not in the PMBOK® Guide
- Identify and define PMI-isms
- Help you to gain familiarity with the types of exam questions
- Provide page references to PMBOK® Guide content
- Increase your probability of passing the exam on your first try

If you have had training in project management, you should not need any materials other than this book, RMC's *PM FASTrack*® exam simulation software, our *Hot Topics* flashcards (audio or hard copy format) and PMI's *A Guide to the Project Management Body of Knowledge, Third Edition* (called the *PMBOK® Guide* in this book) to pass the PMP Exam. If you do not have all of these materials, I invite you to visit RMC's online store at www.rmcpj.com to purchase them before beginning your study.

Free Updates Purchase of this book includes access to updates regarding the PMP exam, as well as additional tricks, tips and information to help you prepare for the exam. Access this information at www.rmcpj.com/extras. Have this book with you when you go to the Web site.

We Need You to Help Us Stop Copyright Infringement As the author of the best-selling PMP exam prep book on the market, RMC is also, unfortunately, the most illegally copied. It is true that many people use our materials legally and with our permission to teach PMP exam preparation. However, from time to time, we are made aware of others who copy our exam questions, "Tricks of the Trade" and other content illegally and use them for their own financial gain.

If you recognize any of RMC's proprietary content being used in other PMP exam prep materials or courses, please notify us at copyright@rmcproject.com immediately. We will do the investigation. Please also contact us at the address above for clarification on how to use our materials in your class or study group without violating any laws.

Contact Us We love to hear your feedback. Is there anything in this book that you wish was expanded, that is too much, anything not covered that you think should be here? We would love to hear from you. Send us an email at pmp@rmcproject.com.

"Tricks of the Trade" and "PM FASTrack" are registered trademarks of RMC Project Management, Inc.

"PMP," "PMBOK," "CAPM," "OPM3," and "PMI" are marks of the Project Management Institute, Inc. RMC Project Management has been reviewed and approved as a provider of project management training by the Project Management Institute (PMI). As a PMI Registered Education Provider (R.E.P.), RMC Project Management has agreed to abide by PMI-established quality assurance criteria.

PMI did not participate in the development of this publication and has not reviewed the content for accuracy. PMI does not endorse or otherwise sponsor this publication, and makes no warranty, guarantee, or representation, expressed or implied, as to its accuracy or content. PMI does not have any financial interest in this publication and has not contributed any financial resources.





About the Author

Rita Mulcahy, PMP, is an internationally recognized expert in project management and a sought-after project management speaker, trainer and author. She has six project management books and products to her credit, and was a Contributor and Reviewer to the *PMBOK® Guide, Third Edition*. Rita has taught thousands of project managers from around the world and helped about 80,000 people prepare for the PMP exam. She is the winner of the 2004 Professional Development Product of the Year award from the Project Management Institute for her book, *Risk Management Tricks of the Trade® for Project Managers* and its companion, *SIRK-Kit® Risk Analysis Kit*.

Rita's speaking engagements draw record crowds. People have stated: "Rita makes you think! The most informative presentation I have ever seen." In fact, Rita has spoken at PMI's annual project management symposium to standing room only crowds and has been asked to present encore presentations at the symposium for an unheard of four years!

She has over 15 years and U.S. \$2.5 billion of hands-on project experience on hundreds of IS, IT, new product, high-tech, service, engineering, construction and manufacturing projects. She has served as an acting PMI Chapter President and Vice President for more than seven years and has taught project management courses for four major universities.

Rita is the founder of RMC Project Management, an international project management speaking, training and consulting firm, and a Global Registered Education Provider with PMI. RMC specializes in real-world project management training; in interpreting the *PMBOK® Guide* for real-world use and helping companies use the latest project management tools and techniques to complete projects faster, with less expense, better results and fewer resources. RMC provides training in basic and advanced project management for team members, project managers, project management offices and senior management. Since its founding in 1991, RMC has provided many quality courses and products to prepare you for the exam. Courses offered include:

- PMP Certification Training
- Project Management Tricks of the Trade®
- Tricks of the Trade® for Risk Management
- Tricks of the Trade® for Determining and Managing Project Requirements
- What Makes a Project Manager Successful?
- Why Projects Fail and How to Prevent Failure
- Tricks for Avoiding Common Project Problems
- Avoiding Common Stumbling Blocks in Risk Management
- Project Management for Teams, Senior Management, Sales and Functional Managers
- Executive Briefing on Project Management
- Setting Up and Managing the Project Office
- All PMI *PMBOK® Guide* Subjects

Why Take the PMP Exam?

Let me quote one of my students. "The exam has changed my life. (Could I be more dramatic?)The process of studying for the exam, taking your class and passing the exam has changed how others look at my abilities."

By passing the exam, you can say that you have passed an international exam designed to prove your knowledge of project management. That is impressive. Since the exam focuses on situations you might see in the real world, passing also indicates that you are experienced. The PMP certification is a way to set yourself apart. There are other benefits.

PMI's salary survey has found that PMPs are paid at least 10 percent more than non-PMPs in the United States (and even more in some other countries). I have had many students who have received a U.S. \$15,000 bonus AND a 15 percent raise when they passed the exam. Others have said they got a job over 200 others because they were a PMP. These are good reasons to finally get around to taking the exam.

Are You Ready for the PMP Exam?

From my experience, 50 percent of those who fail the exam do so because they have not had project management training that uses PMI terminology. Take this seriously! Real-life experience or just reading the PMBOK" *Guide* is not enough to pass this exam! Books cannot help you answer questions like, "You are in the middle of creating a work breakdown structure for the project. Which of the following problems is most likely to occur?"To pass this exam, you need training as well as experience using what you learn in that training. Since 2002, project management training has been required by PMI before one can take the PMP exam.

Do you know enough about project management to take this exam? You do not know enough if you experience two or more of the following problems on projects:

- Large cost or schedule overruns
 - Unrealistic schedules
- Excessive changes to the scope or schedule
- Poor communications and increased conflict
- Running out of time near the end of the project
- Unsatisfactory quality
- Low morale
- People on the team are unsure of what needs to be done

- Excessive rework and overtime
- Too many project meetings

You do not know enough about project management to take this exam if you do not understand or do not use five or more of the following:

- A step-by-step process for managing projects and why each step is necessary
- Project manager, sponsor and team roles
- Historical information from previous projects
- Lessons learned from previous projects
- Creation of lessons learned on your projects
- Project charter
- What is a work breakdown structure, how to create it, and that it is not a list in a bar chart
- How to manually create a network diagram
- Critical path—how to find it and what benefits it provides the project manager
- Three-point estimating
- Monte Carlo analysis
- Earned value
- Schedule compression, crashing and fast tracking
- An unrealistic schedule is the project manager's fault
- Creating a realistic and approved project management plan that you would be willing to be held accountable to achieving
- Measuring and implementing corrective action
- Risk management process and that risk management is not just using a checklist
- Expected monetary value
- Calculating budget reserves and their relationship to risk management
- Controlling the project to the project management plan

If you don't know or do many of the items listed above, I encourage you to consider taking RMC Project Management's three day "Tricks of the Trade" for Project Management course, in addition to our two day PMP Exam Prep course. Combining these courses into a one week experience will give you the 35 contact hours that PMI requires to take the exam. You may also wish to consider enrolling in RMC's e-Learning based PMP Exam Prep course, which also meets PMI's 35 contact hour requirement.

How to Use This Book

Be Sure You Have Current Materials for the Exam

RMC products are frequently updated to give you the latest information available. This book takes into account the latest changes to the exam. Previous editions of this book are now out of date and should not be used to try to pass the exam.

How This Book Is Organized Each chapter is organized the same: an introductory paragraph, a list of Quicktest topics (listed in order of importance), Rita's Process Chart, review materials and a practice exam. All page references in this document refer to the *PMROK" Guide, Third Edition* unless otherwise stated! This book works with the other components of RMC's *PMP Exam Prep System*.

Introduction to Each Chapter The introductory paragraph provides an overview of the chapter.

Quicktest The list at the beginning of each chapter gives you an understanding of what topics are most important and my impression as to their order of importance. Refer to this list when you are finished with each chapter to test your knowledge of the chapter contents and to review what is most important.

Rita's Process Chart Created in 1998 for the first edition of this book, this chart has been greatly expanded to help you integrate knowledge areas and process groups in a unique and easy-to-understand way. Study this chart in the Project Management Processes chapter. Use the repeated chart at the beginning of each chapter to know where you are in the project management process as you work through each knowledge area.

Review Materials and Exercises The review materials contain the latest updates on the PMP exam. (See our *CAPM Exam Prep Kit* if you have less experience and are interested in taking that exam.) Feedback from students indicates that the review material covers all the major items on the exam.

The review materials are more than just words. Throughout this book you will see many exercises. These have been developed based on accelerated learning theory and an understanding of difficult topics on the exam. They will be more helpful to you than you might think. It is important to make sure you do these exercises, rather than jumping right to the answers. Do not skip them, even if their value does not seem evident to you. The exercises and activities are a key benefit of this book. You will see the results when you pass the exam. The answers are listed right after the exercises. Although you may wish the answers were shown later in the book, analysis shows that it is better for you to have them where they are. Here is a trick: Keep a blank paper handy to cover the answers until you have completed each exercise and are ready to review.



Also included in the review material are tricks to passing the exam. They are designated by this image. "Tricks of the Trade" are so important to RMC that it is actually our registered trademark. You will find these tricks helpful to focus your study on what you need to know for the exam.



Occasionally throughout the book, you will see a "memory finger." This indicates information you must memorize for the exam. As we have said, most of the exam does not depend on memorization. However, there are certain things that you will need to memorize in order to pass the exam.

Practice Exam The practice exam at the end of each chapter allows you to review the material and test your understanding. On page 5, you will find a score sheet to use as you take the practice exams. Make a copy of it for each set of sample questions in the book.

NOTE: The questions in this book are tests on the chapter content. They do not simulate the complete range and depth of the PMP Exam questions. You can find such a simulation in the *PM FASTrack*® PMP exam simulation software.

Other Materials to Use to Study for the PMP Exam

Throughout this book, we will from time to time refer to other PMP exam preparation resources offered by RMC. To increase your chances of passing the exam and decrease your overall study time, we recommend that you seriously consider acquiring one or more of the valuable tools listed here. Note that all of these resources are available for purchase online at www.rmcpjct.com.

PMBOK® Guide—Third Edition



PM FASTrack® Exam Simulation Software,

by Rita Mulcahy

RMC's best-selling PMP exam simulation software, offering over 1,300 questions—including tricky situational questions with more than one right answer. Sample exams can be sorted by Knowledge Area, Process Group, Keyword, PMP Simulation and even Super PMP Simulation. All questions

are cross-referenced with this book or the *PMBOK® Guide*, making it easy to go back and study your weak areas. Students say these questions are harder than the ones on the actual exam! Upgrades from previous versions include new questions and scenarios, more “wordy” questions to match the actual exam, automatic question updates, and comprehensive grading and reporting capability.

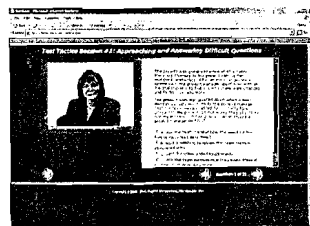


Hot Topics Flashcards (hard copy or audio CD),

by Rita Mulcahy

Are you looking for a way to prepare for the PMP exam that fits into your busy schedule? Now you can study at the office, on a plane or even in your car with *Hot Topics* flashcards—portable and extremely valuable *Hot Topics* flashcards—in hard copy or audio CD format! Over 600 pages of

the most important and difficult to recall PMP exam-related terms and definitions are now available for study as you drive, fly or take your lunch break. Our *Hot Topics* flashcards will enhance your ability to recall and understand PMP exam-related terms, as well as improve your recall of the information you will need to answer those dreaded situational questions. Add instant mobility to your study routine.



Test Tactics Session #1: Approaching and Answering Difficult Questions,

by Rita Mulcahy

In this unique e-Learning based online strategy session, Rita Mulcahy breaks down in detail extremely difficult PMP exam sample questions. In interactive fashion, Rita reviews never before published techniques for interpreting questions, eliminating choices, spotting traps, handling questions with multiple correct answers and choosing the

“best” answer when it is not immediately evident. Upon completion of this session, you will be able to read and interpret difficult questions, analyze the answer choices and determine the most correct answers. No more boring online training experiences!

Only products purchased directly from RMC are supported by RMC.

Question Number	Third Time	Second Time	First Time
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
29.			

Question Number	Third Time	Second Time	First Time
30.			
31.			
32.			
33.			
34.			
35.			
36.			
37.			
38.			
39.			
40.			
41.			
42.			
43.			
44.			
45.			
46.			
47.			
48.			
49.			
50.			
Total Score	Third Time	Second Time	First Time

What will you do different next time?

How to Study for the PMP Exam

There are two serious mistakes you can make in preparing for this exam. The first is reading every book you can find. The second is studying too long. This book is part of the fast way to pass the exam. It is designed to save you time and increase your understanding. If you feel the need to read more books to make sure you pass the exam, simply take a PMP simulation exam using *PM FASTrack*® and see how you score. (See "Using This Book With the PMP Exam Prep System," on the next page.)

If you purchased this book directly from RMC, you received extra study materials free. You should read this book first before using those materials.

The Magic 'Three

Studies have shown that if you visit a topic three times, you will remember it. Therefore, you should read this book and use our products three times before you take the exam.

Be in Test-Taking Mode

Get used to jumping from one topic to another and practice taking an exam for four hours. Do not underestimate the physical aspects of taking an exam lasting that long.

Your Step-by-step Study Plan

We recommend that you use one of the following study plans. Follow Plan A if you do not own RMC's complete PMP Exam Prep System. Follow Plan B if you own the entire system.

Plan A: Using This Book As a Stand-alone

1. Before you review the book, take the practice exams in one sitting — as you would during the actual exam. This will give you a baseline to tell you how much you have learned after using the book. It will also help you determine how much study time you need and what chapters to read more carefully. Do not analyze your right and wrong answers at this point; just note the chapters where you have the most and least difficulty. If you are too excited to get started, skip this step and go to Step 2.
2. Read the material in this book for the first time, (focusing on the chapters where you had the most errors in Step 1). Refer to Rita's Process Chart for each chapter, and at the same time, skim through the corresponding chapter in the *PMBOK*® Guide to get an understanding of the flow of the processes.
3. As you finish each chapter, review the Quicktest terms listed on the first page of the chapter.
4. If it is at all possible, form a study group any time after you have read the book for the first time on your own. This will actually make your study time shorter and more effective! You will be able to ask someone questions and the studying (and celebrating afterward) will be more fun. A study group should consist of only three or four people. (See "How to Use This Book in a Study Group" on the next page.)
5. Spend more time reviewing any topics you score poorly on before moving to Step 6.
6. PASS THE EXAM!

Plan B: Using This Book With the PMP Exam Prep System

1. Before you review the materials, take 20 questions in each process group and knowledge area using **PM FASTrack**®. This will give you a baseline to tell you how much you have learned after using the materials. It will also help you determine how much study time you need and what chapters to read more carefully. Do not analyze your right and wrong answers at this point; just note the chapters where you have the most and least difficulty. If you are too excited to get started, skip this step and go to Step 2.
2. Read the material in this book for the first time (focusing on the chapters where you had the most errors in Step 1). Refer to Rita's Process Chart for each chapter, and at the same time, skim through the corresponding chapter in the **PMBOK**® Guide to get an understanding of the flow of the processes.
3. As you finish each chapter, review the Quicktest terms listed on the first page of the chapter, use the Hot Topics flashcards to improve recall and test your understanding of that chapter. Then take an exam on the chapter in **PM FASTrack**®. You are doing well if you score over 70 percent.
4. If it is at all possible, form a study group any time after you have read the book for the first time on your own. This will actually make your study time shorter and more effective! You will be able to ask someone questions and the studying (and celebrating afterward) will be more fun. A study group should consist of only three or four people. (See "How to Use This Book in a Study Group" topic below.)
5. Spend more time reviewing any topics you score poorly on before moving to Step 6.
6. Retake the practice tests until you score over 85 percent on a PMP simulation exam. You should be careful not to become too familiar with the questions. **PM FASTrack** and its over 1,300 questions will help make sure you do not see the same question too often, giving you the most representative evaluation of your knowledge. **YOU ARE OVERSTUDYING** if you see too many of the questions repeated in **PM FASTrack**!
7. Use the Hot Topics flashcards, if you have them, to retain the information you have learned until you take the exam.
8. **PASS THE EXAM!**

How to Use This Book in a Study Group

I am honored that you have chosen my book for your group. Pick someone to lead the discussion of each chapter (preferably someone who is not comfortable with the chapter). Each time you meet, go over questions about topics you do not understand and review the hot topics on the exam using the Hot Topics flashcards, if you have them. Most groups meet for one hour per chapter. Either independently or with your study group, do further research on questions you do not understand or answered incorrectly.

Each member of the study group will need his or her own copy of the book. Notice that you do not have to create exercises, homework or even class activities; they are already provided for you. Make sure you are not violating international copyright laws by creating any derivative works from this copyrighted book. The best thing is to follow the book content. If you are leading or teaching a structured PMP exam preparation course using RMC products, I encourage you to contact RMC for information on our Corporate Partnership program, which may give you the right to create overheads or other materials using content from this book.

I also encourage you to contact RMC about other tools we offer to study groups and independent instructors, or to receive quantity discounts on this book, **PM FASTrack** exam simulation software or Hot Topics flashcards.



Qualifying to Take the Exam

To take this exam you must meet requirements as outlined by the Project Management Institute. The current requirements are described below.

Category	General Education	PM Education	PM Experience	Experience	Number of Questions
One	Bachelors degree	35 contact hours	4,500 hours	Three years within last six years	*200
Two	High School graduate	35 contact hours	7,500 hours	Five years within last eight years	

Consider taking PMI's CAPM® Exam if you do not meet the above requirements. The requirements can be found at www.pmi.org. Currently, test takers must document 1,500 hours of experience or 23 hours of project management education to qualify for this exam. See our *CAPM Exam Prep Kit* to help you prepare.

Applying to Take the Exam

You must submit an application to PMI. Applications may be submitted by mail or electronically. Submit online if at all possible, since PMI's response time is faster for electronic submissions. When your application is accepted, you will receive a letter authorizing you to make an appointment to take the exam. PMI is quickly moving to offer computerized testing around the world in many languages.

Watch out! ONCE YOU RECEIVE YOUR AUTHORIZATION LETTER, YOU MUST PASS THE EXAM WITHIN ONE YEAR! In some instances, testing centers may not have openings for several weeks.

* See the next page for details about the breakdown of questions on the PMP exam.



What Is the PMP Exam Like?

Keep in mind three very important things about this exam. First, THE PMP EXAM IS NOT A TEST OF THE INFORMATION IN THE *PMBOK*™ Guide! Second, you cannot rely only on real-world experience. Third, training in professional project management based on the *PMBOK*™ Guide is critical! However, do not let any organization fool you into thinking you need weeks of training or a master's certificate in project management to take the exam.

The PMP exam includes 200 multiple-choice questions with four answers per question. The exam must be completed in four hours. (NOTE: If your study material has five choices per question, do not use it! It is either related to an old exam and therefore out of date, or it has not been created using the same modern test creation standards as the exam.)

Twenty-five of the 200 exam questions are "pre-release questions," meaning they are not included in your score for the exam. These questions will be randomly placed throughout the exam. You will not know which ones are which. They will be used by PMI to validate the questions for future inclusion in the master database. Your score will be calculated based on your response to the remaining 175 questions. Passing score on the exam is now 141 out of 175, approximately 81%.

The questions are randomly generated from a database containing hundreds of questions. The questions may jump from topic to topic and cover multiple topics in a single question. You get one point for each correct answer. There is no penalty for wrong answers.

The following table breaks out the percent of scored questions currently on the exam in each process group:

PM Process	Percent of Questions
Project Initiating	11
Project Planning	23
Project Executing	27
Project Monitoring and Controlling	21
Project Closing	9
Professional and Social Responsibility	9

For many people the toughest knowledge areas on the exam are Framework, Integration, Procurement, Risk, and Time. The toughest process groups are Executing, Monitoring and Controlling, and Professional and Social Responsibility. Make sure you study these carefully.

PMI occasionally makes changes to many aspects of the exam, including qualification requirements, the application process, passing score, and breakdown of questions in each process group. For the latest information, please visit www.pmi.org and read your authorization letter carefully. Any differences between what is listed here and what is communicated by PMI should be resolved in favor of PMI's information.

WARNING: THE PMP EXAM IS NOT LIKE ANY MULTIPLE QUESTION EXAM YOU HAVE TAKEN BEFORE. The exam is designed to weed out those who should not be PMPs and passing it is a major achievement. The questions can be tricky and wordy. If you know

what you are doing as a project manager, you pass the exam. If you do not know what you are doing, you do not pass.

Be aware of the following for the exam:

The PMP exam tests knowledge, application and analysis. This makes the PMP exam more than a test of memory. You must know how to apply the information in this book and be able to analyze situations involving this information. Do not expect the exam to have all straightforward, definition-type questions.

- It is important to realize that the PMP exam deals with real-world use of project management. It contains about 150 "What would you do in this situation?" questions (situational questions). These questions are extremely difficult if you have not used project management tools in the real world or if your project management efforts include common errors. You have to have been there to pass the exam.
- There may be instances where the same data is used for multiple questions. This is particularly true of network diagram questions.
- It always feels like more for the test taker, but only a few questions require you to MEMORIZE the step-by-step *PMBOK*™ *Guide* processes. Only 10 to 12 questions require you to MEMORIZE the inputs or outputs from the *PMBOK*™ *Guide*. These are discussed in later chapters.
- Expect only eight to 10 formula-related calculations on the exam.
- Expect only 10 to 12 earned-value questions on the exam. Not all of these require calculations using the formulas.
- Most acronyms (e.g., WBS for work breakdown structure) will be spelled out.
- The correct answers should not include direct quotations from the *PMBOK*™ *Guide*.
- Most students feel uncertain of only 40 or fewer questions of the zoo questions on the PMP exam.
- Many students have needed only 2½ hours to finish the PMP exam and then taken the rest of the time to review their answers.

Watch whose advice you take. I am often surprised about what people say about the exam, versus what the exam is really like. When you also consider the fact that the exam has changed over the years, it is best to be wary of advice that does not come from a recognized authority.

The questions are mostly situational, many are ambiguous and very wordy and some even seem like they have two right answers. Be prepared for the following types of questions so you will not waste time or be caught off guard when you are taking the exam.

1. Situational questions These questions require you to have "been there."

You receive notification that a major item you are purchasing for a project will be delayed. What is the BEST thing to do?

- A. Ignore it, it will go away.
- B. Notify your boss.
- C. Let the customer know about it and talk over options.
- D. Meet with the team and identify alternatives.

Answer D

2. Questions with two or more right answers Questions that appear to have two, three or even four right answers are a major complaint from many test takers. Most of the questions will list choices that all could reasonably be done, or that less experienced or less qualified project managers might choose. To those people, it looks like there is more

than one right answer. To more experienced project managers, the same questions may appear to have one or maybe two right answers. Honestly, the more of a problem you have with this, the less you really know about project management.

As you go through questions and review the answers in this book or in our other products, look for instances where you think there is more than one right answer and try to figure out why you think so. I have intentionally put questions like these into my products for PMP exam preparation. The explanations will be key to understanding why your right answer is not the right answer.

Let's look again at question number one. Couldn't we really do all of the choices? The right answer is certainly D, but isn't it also correct to tell the customer? Yes, but that is not the first thing. Essentially this question is really saying, "What is the BEST thing to do *next*?"

3. **Questions with extraneous information** It is very important to realize that not all information included in a question will be used to answer the question. Can you imagine multiple paragraphs of information for each question on the exam? Most of the data provided will NOT be needed to answer the question. In the following question, the numbers are extraneous.

Experience shows that each time you double the production of doors, unit costs decrease by 10 percent. Based on this, the company determines that production of 3,000 doors should cost \$21,000. This case illustrates:

- A. learning cycle.
- B. law of diminishing returns.
- C. 80/20 rule.
- D. parametric cost estimating.

Answer D

4. **Out of the blue questions, or words that you have never seen before.** Many people taking the exam expect that all the terms used as choices should mean something. They do not! There are often made-up terms used on the exam. Perhaps the question writer needed another choice, perhaps they are intentionally added to trick those who do not know the answer. If you consider yourself well trained and see a term you do not know on the exam, chances are it is not the right answer.

No matter how well you study, there will ALWAYS be questions where you have no idea what the question is asking. Here is an example that will seem out of the blue until you finish reading this book.

The concept of "optimal quality level is reached at the point where the incremental revenue from product improvement equals the incremental cost to secure it" comes from:

- A. quality control analysis.
- B. marginal analysis.
- C. standard quality analysis.
- D. conformance analysis.

Answer B

5. Questions where understanding is important In order to answer many of the questions on the exam, you must understand all the topics. Memorization is not enough!

The process of decomposing deliverables into smaller, more manageable components is complete when:

- A. project justification has been established.
- B. change requests have occurred.
- C. cost and duration estimates can be developed for each work element at this detail
- D. each work element is found in the WBS dictionary.

Answer C.

6. Questions with new a approach to known topic There will be many instances where you understand the topic, but have never thought about it in the way the question describes.

In a matrix organization, information dissemination is MOST likely to be effective when:

- A. information flows both horizontally and vertically.
- B. the communicationsflows are kept simple.
- C. there is an inherent logic in the type of matrix chosen.
- D. project managers and functional managers socialize.

Answer A.

On Exam Day

You must bring your authorization letter from PMI to the test site, as well as two forms of ID with exactly the same name you entered on the exam application.

You will be given scratch paper, pencils (and possibly even earplugs or headphones) and have the chance to do a 15 minute computer tutorial, if your exam is given on computer, to become familiar with the computer and its commands. NOTE: The testing center will require you to exchange your used scratch paper if you need more during the exam.

When you take the exam, you will see one question on the screen at a time. You can answer a question and/or mark it to return to it later. You will be able to move back and forth throughout the exam.

You will have multiple chances to indicate that you have completed the exam. The exam will not be scored until you indicate that you are ready, or your time is up. You will receive a printed summary of your test results. If you pass, the computer will print out a certificate, and you will officially be certified. If you do not pass, PMI will send you information on retaking the exam. You will have to pay an additional fee to retake the exam.



Tricks for Taking the PMP Exam

1. Keys to answering PMI's questions:
 - Understand the material cold. Do not assume this exam tests memorization; it tests knowledge, application and analysis! You must understand the items in this book, how they are used in the real world and how they work in combination with each other.
 - Have real-world experience using all the major project management techniques.

- Read the PMBOK" *Guide*.
 - Understand the areas PMI emphasizes (PMI-isms, explained later in this book)
 - Be familiar with the types of questions.
 - Practice interpreting ambiguous and wordy questions.
 - Practice being able to pick an answer from what appears to be two or three right answers.
 - Get used to the idea that there will be questions you cannot answer.
2. Control the exam, do not let it control you. How would you feel if you read the first question and had no idea of the answer? The second question? And the third question? For many reasons, this is likely to occur! Here is what to do. If you do not immediately know the answer to the question, use the Mark for Review function and come back to it later. This will mean that your first pass through the exam will be generally quick. More prepared now? Imagine how good you will feel when all you have to do is go through a few questions that were confusing to you. Remember this. It could be a big stress reliever for you on the exam.
 3. Control your frustration. You might very well dislike or disagree with some of the questions on this exam. You might also be surprised at how many questions you mark for review. If you are still thinking about question 20 when you reach question 120, there will have been 100 questions that you will not have looked at closely enough. Take care to control your frustration.
 4. Answer the question from PMI's perspective, not the perspective you have acquired from your life experience. If this approach does not give you an answer, rely on your training and, lastly, your life experience.
 5. First identify the actual question in the words provided (it is often the last sentence), then read the rest of the question. Note the topics discussed in the question and the descriptors (e.g., "except," "includes," "not an example of"). This should help you understand what the question is asking and reduce the need to reread questions. Determine what your answer should be, and then look at the answers shown.
 6. One of the main reasons people answer incorrectly is because they do not read all four choices. Do not make the same mistake! Practice reading the questions and all four choices when you take the practice exams. It is best to practice reading the choices backwards (choice D first, then C, etc.). Practice in this area will help you select the BEST answer.
 7. Practice quickly eliminating answers that are highly implausible. Many questions have only two plausible options and two obviously incorrect options.
 8. There may be more than one "correct" answer to each question, but only one "BEST" answer. Practice looking for the BEST answer.
 9. Be alert to the fact that information in one question is sometimes given away in another question. Write down things that you do not understand as you take the exam. Use any extra time at the end of the exam to go back to these questions.
 10. Attempts have been made to keep all choices the same length. Therefore, do not follow the old rule that the longest answer is the right one.

11. A concerted effort has been made to use “distracters”—choices that distract you from the correct answer. These are plausible choices that less knowledgeable people will pick. Distracters make it appear as though some questions have two or more right answers. To many people, it seems as though there are only shades of differences between the choices. Look for this type of question as you take practice exams.
12. Look for words like “first,” “last,” “next,” “best,” “never,” “always,” “except,” “not,” “most likely,” “less likely,” “primary,” “initial,” “most,” etc. Make certain you clearly read the question, and take note of these words, or you will answer the question incorrectly! There are many questions that require you to really understand the process of project management and its real-world application.
13. Watch out for choices that are true statements but not the answer to the question.
14. Watch out for choices that contain common project management errors. They are intentionally there to determine if you really know project management. Therefore, you may not know that you answered a question incorrectly! Look for errors in your knowledge and practice as you go through this book. (See “Common Project Management Errors and Pitfalls” list at the end of this chapter.)
15. Options that represent broad, sweeping generalizations tend to be incorrect, so be alert for “always,” “never,” “must,” “completely” and so forth. Alternatively, choices that represent carefully qualified statements tend to be correct, so be alert for words such as “often,” “sometimes,” “perhaps,” “may,” and “generally.”
16. When a question asks you to fill in a blank space, the correct answer may not be grammatically correct when inserted in the sentence.
17. As soon as you are given scratch paper when you arrive at the exam, write down anything you were having trouble remembering. This will free up your mind to handle questions once the information you are concerned about is written down.
18. Visit the exam site before your exam date to determine how long it will take to get there and to see what the testing room looks like. This is particularly helpful if you are a nervous test taker.
19. Just because you are taking an exam, do not expect the exam site to be quiet. A student from one of my PMP Exam Prep courses had a band playing outside the testing center for three hours. Others have had someone taking an exam that required intensive typing, and thus more noise, right next to them. Many testing sites will have earplugs or headphones available.
20. Look for the “rah, rah” answer (e.g., “The project manager is so important,” “The WBS is so useful”).
21. Take the night off before the exam to do something relaxing and get a little extra sleep. **DO NOT STUDY!** You will need time to process all you have learned so you can remember it when you take the exam.
22. Make sure you are comfortable during the exam. Wear layered clothing and bring a sweater to sit on in case the chairs are uncomfortable.

23. Bring snacks! Bring lunch! You will not be able to bring snacks into the exam room, but having them stored close by may stop hunger pains.
24. Use deep breathing techniques to help relax. This is particularly helpful if you are very nervous before or during the exam and when you notice yourself reading the same question two or three times.
25. Use all the exam time. Do not leave early unless you have reviewed each question twice.
26. Remember that it is okay to change your answers as long as you have a good reason.
27. Create a test-taking plan and stick to it. This may mean, "I will take a ten minute break after every 50 questions because I get tired quickly," or "I will answer all the questions as quickly as possible and then take a break and review my answers."

Recurring Themes—PMI-isms to Know for the PMP Exam

“PMI-ism” is a term I coined to refer to the items PMI stresses on the exam that most project managers do not know. PMI-isms are not stressed and sometimes not even mentioned in the *PMBOK® Guide*! Those who write questions on the exam know what most project managers do wrong. This knowledge helps them to write questions that weed out those who should not be PMPs.

Understanding PMI-isms will help you pick the best answer from what seems like more than one correct answer. Some of the topics are listed only here and others are summarized here and described more fully later in the book. Review this list again just before you take the exam and make sure you understand all these PMI-isms.

1. There is a basic assumption that you have records (historical information) for all previous projects that include what the work packages were, how much each work package cost, and what risks were uncovered. These are now referred to in the *PMBOK® Guide* as part of organizational process assets. You are probably laughing because you do not have such information. You may even be saying, "That is a good idea!" For the exam, assume that you have them for all projects and that you create them for existing projects. Organizational process assets are an input to almost every project management process.

Why would PMI stress historical records? They are exceedingly valuable (like gold) to the project manager, the team, the performing organization and even the customer.

2. Project cost and schedule cannot be finalized without completing risk management.
3. PMI stresses the fact that a project manager must work within the existing systems and culture of a company. They call these enterprise environmental factors and they are inputs to many processes.
4. The word "task" is not used in the *PMBOK® Guide*. There are work packages, activities and/or schedule activities.
5. The term Gantt chart is not used, only bar chart.
6. You must understand the process of project management; e.g., what to do first, second, etc., and why! See Rita's Process Chart and Rita's Process Game in the Project Management Processes chapter.
7. A project manager's job is to focus on preventing problems, not to deal with them. What do you spend time doing every day? If you spend all your time dealing with problems, you are not a great project manager. You should have planned the project to address the problems or to prevent the problems you knew would be coming.
8. Percent complete is an almost meaningless number. Project managers should not spend time collecting useless information. It is better to control the project and know the status through other actions.

9. A great project manager does not hold meetings where you go around the room asking all attendees to report. Such meetings are generally, but not always, a waste of time, as such information can be collected through other means. There are more important topics for team meetings.
10. A project manager has authority and power. She can say "No" and work to control the project to the benefit of the customer.
11. The project must be completed on time and on budget and meet any other project objectives; otherwise it is the project manager's fault.
12. Delays must be made up by adjusting future work.
13. Know the following about the project management plan:
 - The project management plan is approved by all parties, is realistic and everyone believes it can be achieved.
 - The project is managed to the project management plan.
 - A project management plan is not a bar chart, nor is a WBS created in a bar chart or a list in a bar chart.
 - Make sure you know what actions it takes to create a real project management plan.
 - Most project managers have never developed a project management plan that contains all the items in the *PMBOK*" Guide's definition of a project management plan. Make sure you are familiar with what goes into a project management plan and what each component includes.
14. If at all possible, all the work and all the stakeholders are identified before the project begins.
15. Stakeholders are involved in the project and may help identify and manage risks. They are involved in team building and their needs are taken into account while planning the project and in the communications management plan.
16. Many people fail the exam because their vision of what a project manager is and what he should do is different from that outlined in the *PMBOK*" Guide. They often do not exercise the power and perform the activities described in the *PMBOK*" Guide. Others fail the exam because they think the project manager is supposed to plan the project on his own and TELL everyone what to do.
17. All roles and responsibilities must be CLEARLY assigned to specific individuals on the project. Such responsibilities may include things like attending meetings, as well as project work. In my studies, lack of clear assignment is the number one complaint of team members. This is therefore worth thinking about a little more.
18. The work breakdown structure (WBS) is the foundation of all project planning and should be used on every project.
19. You cannot get something for nothing. A change in scope MUST be evaluated for impact to time, cost, quality, risk and customer satisfaction. Project managers must have enough data about their projects to do this analysis. Do you?

20. Project managers can save the universe, are "wonderful," "great," and must be very skilled (a "rah! rah! for project management" topic).
21. PMI does not approve of gold plating (adding extra functionality).
22. The definition of "kickoff meeting" used on the exam may be different from a "kickoff meeting" you might hold.
23. The project manager must be proactive. Correct answers indicate that the project manager must find problems early, look for changes, prevent problems, etc.
24. Planning is very important and all projects must be planned.
25. Project managers should always plan before they do. Therefore, there should be management plans for every knowledge area. Use of management plans is discussed throughout the *PMBOK* Guide and yet most people have never been taught them, nor do they create them. Look for management plans in each chapter and make sure you have an understanding of each.
26. One should always follow the plan-do-check-act cycle stressed in quality management.
27. All changes must flow through the change request process and integrated change control.
28. The constraints the project manager must manage (often called the "triple constraint") include more than three items. They include scope, time, cost, quality, risk, and customer satisfaction. Any change to one must be investigated for impacts to all as part of integrated change control.
29. The *PMBOK* Guide talks about what is needed for a larger project. Therefore, many of the items described in the *PMBOK* Guide are inappropriate for some projects, maybe yours. Make sure you understand why the processes and work described in the *PMBOK* Guide would be necessary on larger projects in order to pass the exam. The *PMBOK* Guide is real-world; you just might work on small projects.
30. If you do not manage cost on your projects, you should be more careful studying cost.
31. Most companies have a project management office and that office has important authority over the project.
32. The project manager should decide which processes in the *PMBOK* Guide should be used on each project.
33. The project manager is assigned during project initiating.
34. Notice how many times corrective action and preventive action are mentioned in the *PMBOK* Guide. They are there because most project managers spend all their time dealing with problems rather than preventing them. Make sure you understand these two concepts exceedingly well.
35. Many project managers do not properly plan their projects. Therefore, the work they do while the project work is ongoing is vastly different from what should be done,

and different from what is outlined in the *PMBOK® Guide*. Make sure you check your knowledge of what activities are included in the project executing and project monitoring and controlling process groups. The exam will give you the most trouble in these areas.

36. There is a basic assumption on the exam that you have company project management policies (don't laugh, we will get there) and that you will adapt them for use on your projects. These may include project management methodologies, risk procedures, and quality procedures. So, assume you have them when you take the exam.
37. The project manager has some human resource responsibilities of which you might not be aware.
38. The project manager should recommend improvements to the performing organizations's standards, policies and processes. Such recommendations are expected and welcomed by management.
39. Quality should be considered whenever there is a change to any component of the "triple constraint."
40. Quality should be checked before an activity or work package is completed.
41. The project manager must spend time trying to improve quality.
42. The project manager must determine metrics to be used to measure quality before the project work begins.
43. The project manager must put in place a plan for continually improving processes.
44. The project manager must make sure the authorized approaches and processes are followed.
45. Some of the quality activities could be done by a quality assurance or quality control department.
46. You are required to understand that people must be compensated for their work. (I am serious, this question has appeared on the exam.)
47. A project manager creates a reward system during the planning process group.
48. You should spend time documenting who should do what.
49. Since most projects are managed in a matrix environment, such seemingly easy topics as motivational theories and powers of the project manager become quite serious on the exam.
50. All roles and responsibilities on the project must be clearly assigned and closely linked to the project scope statement.
51. Lessons learned (as part of historical records) is a PMI-ism.



Common Project Management Errors and Pitfalls

If you were reading this chapter carefully, you noted that common errors in project management are often listed as choices on the exam. Here is a summary of some of the major errors even experienced project managers make, so that you can be sure you will not make the same mistakes.

Errors include:

- Focusing on asking for percent complete
- Holding "go around the room" type status meetings
- Spending most of your time babysitting team members by constantly checking on them
- Asking to cut 10 percent off the estimate
- Thinking a bar (Gantt) chart is a project management plan
- Not attempting to obtain finalized requirements
- Not getting real resource commitments
- Not having a reward system
- Not focusing on quality
- Not having a control system
- Not having management plans
- Not measuring against the project management plan, or even creating metrics
- Not spending time finding and eliminating root causes of problems or deviations
- Not implementing corrective action to keep the project in line with the project management plan
- Not reevaluating the effectiveness of the project management plan
- Not reevaluating the accuracy or completeness of schedule, cost, scope
- Ignoring resource managers' need to have their people do their own departments' work
- Not realizing the project can affect the reputation of team members
- Not realizing the project manager has some human resource responsibilities to the project team, such as project job descriptions and adding letters of recommendation to team members' human resource files
- Blaming unrealistic schedules on management instead of realizing they are the project manager's responsibility

Quicktest

- Stakeholder
- Stakeholder management
- Organizational structure
 - Matrix
 - Strong
 - Weak
 - Balanced
 - Functional
 - Projectized
 - Project expeditor
 - Project coordinator
- Constraint
- Triple constraint
- Definition of a project
- Definition of a program
- Project management office (PMO)
- Product life cycle
- Project life cycle
- Operational work
- Areas of PM's expertise
- OPM3
- Tight matrix

The trick to reading this chapter is to make sure you keep an open mind and specifically look for things you do not know. You will find lots of small things. These can add up on the exam. Just knowing the true definition of a project can get you up to four questions right on the exam. Most importantly, read this chapter (and the rest of this book) with an open mind to finding out what you do not know. You will LEARN, rather than just MEMORIZE to pass the exam. You will be a better project manager when you are finished. My purpose is to help you to learn!

Definition of a Project (page 5; all page number references are to the *PMBOK® Guide—Third Edition*):
You must understand the definition of a project.

- Temporary endeavor with a beginning and an end
- Creates a unique product, service or result
- Is progressively elaborated—distinguishing characteristics of each unique project will be progressively detailed as the project is better understood

Think this is on the exam? No it is not, at least not on the exam the way you might think. Let me explain.

What is a project? If your boss walked in to your office today and said, "The system is broken. Can you figure out what is wrong with it and fix it?" would this be a project?

Are you reading on before you have thought through the question I asked? Please read it again and think of your answer. Make the wrong decision and your career may be over.

I have taught thousands of students and almost no one has been taught the concept that you must take what you are given and organize the work into appropriate projects. If you know the definition of a project, then you know that the planning process will produce schedules and budgets. Can you schedule "fix it" if you do not know what is wrong? Of course you cannot, so there are at least two projects in the previous story.

Remember that a project manager must come up with a project management plan that can be agreed to, that people believe is realistic, and most importantly, that they can stake their reputations on. It is time someone said this out loud: Excluding approved

changes for additional work, if the project manager does not get the project completed for the time and cost they agreed to (in addition to meeting other objectives) he should be relieved of his position! Why so dramatic? Studies conducted by the Standish Group in 2004 show that only 34 percent of projects are successful. This means we are doing a bad job of project management and things need to change.

The exam will give you situations which you will need to analyze. It may describe issues where more than one project is being managed as a single project, or there is not a real, authorized project at all. This should be easy to see, now that I have warned you.

There is another major issue that may be a problem for you on the exam. Do you know what a project is? Are you really working on projects? If your "projects" are less than three months long and have less than 20 people on the team, you might not be working on projects. For example, let's say you work on a help desk. Someone contacts you about a problem they are having and your job is to fix it. Certainly such things as a WBS will be of great help, but do you need a network diagram? How about management plans for scope, time and cost? Probably not. What about hardware installation projects? Are they all the same? Maybe they are not really projects at all.



In order to pass this exam, you will need to get your mind around things that are definitely projects. I suggest that you think of much larger projects than your own. When you do that, more of what is described here will make sense and you will better understand what is intended.

Operational Work (page 6) Operational work is different than project work. You must be able to tell the difference for the exam. You may see instances where the real problem in the question is that someone is attempting to manage ongoing work, like manufacturing, rather than a project.

What Is Project Management (page 8) Many people think project management is just managing, or even worse, that one can buy some software and be a project manager. Project management is a profession which is growing extremely fast. It is both a science and an art, and follows a systematic process. The Project Management Institute breaks project management into Professional and Social Responsibility, knowledge areas and process groups. Knowledge areas are Integration, Scope, Time, Cost, Quality, Human Resources, Communications, Risk and Procurement. Process groups follow the process of project management: Initiating Process Group, Planning Process Group, Executing Process Group, Monitoring and Controlling Process Group, Closing Process Group.

The answer to "What is project management?" is described throughout this book. It can involve technical terms and processes, but it also involves roles and responsibilities and authority level. Do you know what project management is? Chances are, there are some key aspects of project management that have slipped by you and will be on the exam. Many people with advanced degrees in project management fail this exam because they do not know what project management really is. Be careful to discover the answer as you read this entire book. If you are reading this for the second time, have you already discovered that project management might be more than you thought?

Definition of a Program (page 16) A program is a group of projects. Their management is coordinated because they may use the same resources, the results of one project feed into another, or they are parts of a larger "project" that has been broken down to

smaller projects. This coordination provides decreased risk, economies of scale and improved management that could not be achieved if the projects were not managed as parts of a program.

When you discover that you have more than one project, you can manage them as separate projects or, if there is a benefit to it, you can manage all the projects as a program. This should be done, as the definition says, only when there is a value to it.

Project Management Office (PMO or Program Office) (pages 17, 32) A department that centralizes the management of projects. A PMO usually takes one of three roles:

- Providing the policies, methodologies and templates for managing projects within the organization
- Providing support and guidance to others in the organization on how to manage projects, training others in project management or project management software, and assisting with specific project management tools
- Providing project managers for different projects, and being responsible for the results of those projects (All projects, or projects of a certain size, type or influence, are managed by this office)

Be careful to understand the authority of the PMO and how it is different from the other players on a project. The PMO is an organizational structure, not a person. The role of the project manager is described throughout this book. The roles of the sponsor and other people involved in a project are described in the Human Resources chapter. The PMO may:

- Manage the interdependencies between projects
- Help provide resources
- Terminate projects
- Help gather lessons learned and make them available to other projects
- Provide templates (i.e., for work breakdown structures)
- Provide guidance
- Provide enterprise project management software
- Be more heavily involved during project initiating than later in the project

There is a strong trend to start PMOs. But realize the risk. If they do poorly, they generate a negative feeling towards professional project management that can set your company back years. To make them work, you should remember these key concepts:

- The role of the PMO must be clearly defined
- Pick one of the three roles, as previously defined, and stick to it without trying to do everything
- All those who are in the PMO must be PMP certified
- The commitment of executive management is required
- The PMO will not improve your project performance without the use of proper project management processes and techniques, so professional project management must be encouraged

Objectives There can be lots of different types of objectives mentioned on the exam, from project objectives (the most important type) to product objectives, cost objectives and stakeholder objectives. Make sure you read each question that mentions objectives carefully.

Project objectives are critical on a project as illustrated by the following summary. Read carefully to better understand this focus.

- Project objectives are contained in the preliminary project scope statement and project scope statement

- Projects are considered complete when the objectives have been met
- A reason for terminating a project before completion is that the project objectives cannot be met
A more complete understanding of the objectives is achieved over the length of the project
- It is the project manager's role to accomplish the project objectives
- Objectives should be clear and achievable
- The reason for quality activities is to make sure the project meets its objectives
- The reason for the risk process group is to enhance opportunities and reduce threats to the project objectives
Things that could negatively impact the project objectives, such as risk and stakeholders' influence should be watched and tracked
- Projects often require tradeoffs between the project requirements and the project objectives
- Project objectives are determined in the initiating process group and refined in the planning process group
One of the purposes of the develop project management plan process is to determine how work will be accomplished to meet project objectives

Management by Objectives (MBO) A management philosophy that says an organization should be managed by objectives. It has three steps:

1. Establish unambiguous and realistic objectives
2. Periodically evaluate if objectives are being met
3. Implement corrective action

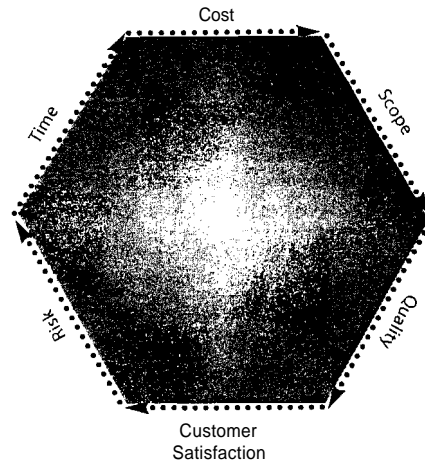
You should understand what this means for the project manager. If the project is not in line with or does not support the corporate objectives, the project is likely to lose resources, assistance and attention. You should also understand that MBO works only if management supports it.

Constraint or "Triple Constraint" (page 8) It is often said that a project manager must handle or juggle many things to accomplish a project. Project constraints are time, cost, risk, scope, or any other factors that limit options. Such factors may include the date a milestone or the project must be completed, or the maximum allowable risk a project may have. The "triple constraint" is used to help evaluate competing demands. Triple constraint is an old term that originally included cost, time and scope. A more advanced, expanded definition also includes quality, risk and customer satisfaction (or stakeholder satisfaction). The exam and this book will use the term "triple constraint" to refer to the expanded definition.

Management directly or indirectly sets the priority of each of the components of the "triple constraint." This prioritization is used throughout the project by the project manager to properly plan the project, evaluate the impact of changes and prove successful project completion. It is important to realize that a change to one component of the "triple constraint" should be evaluated for an effect on the other components. In other words, it is unlikely that you can shorten the schedule without causing a negative impact on cost, risk, etc.

It is understood that stakeholders, managers and others will try to get something changed or added to the project. It is the project manager's responsibility to analyze these change requests and identify the impacts to all components of the "triple constraint" through integrated change control. You will see the concept of the "triple constraint" used in many areas of this book. Take time to really understand the integrated change control discussion

in the Integration chapter and how it relates to the "triple constraint." Whenever you see the term here, remember that we are using the broader definition.



OPM3 PMI's organizational maturity model for project management is called OPM3. This model is designed to help organizations determine their level of maturity in project management. You need only know it exists for the exam.

Areas of Expertise (page 12) It is important to realize that a project manager can successfully manage a project whether or not he has relevant technical knowledge. A nurse can manage a construction project. An engineer can manage a graphic design project. Obviously, technical knowledge is preferred. Project managers must have people-managing and interpersonal skills and general management skills such as negotiation, leadership and mentoring. A key area of expertise for a project manager is understanding the project environment. This can involve knowing who the stakeholders are, why the project is being done and what is the strategic plan of the performing organization (the company or division of the company doing the project).

Stakeholder, Stakeholder Management (page 24) You should think of stakeholders as more than the project manager, customer, sponsor and team. A stakeholder is someone whose interests may be positively or negatively impacted by the project. Key stakeholders include: the project manager, customer, performing organization, project team, project management team, sponsor, and the project management office. They may also include those who may exert influence over the project, but would not otherwise be considered stakeholders.

You will see the topic of stakeholders repeated and expanded as you read this book, as their needs are analyzed and managed throughout the project. For example, in creating the preliminary project scope statement, the project manager analyzes the needs of the sponsor, who is also a stakeholder. Interestingly, when you pass your exam and receive your score sheet, you will only see stakeholder analysis specifically mentioned under the Initiating process group, although it is done throughout the project.

Many people score poorly here, so read the next area very carefully. See also the section on roles and responsibilities in the Human Resources chapter.

What should we do with stakeholders?

- Identify **ALL** of them. Ask yourself, "Why would this be so important?" Get the answer right and you will get two more answers correct on the exam. Any stakeholders who are missed will likely be found later. When they are uncovered, they will make changes and could cause delays. Changes made later in the project are much more costly and harder to integrate than those made earlier. Identifying all the stakeholders helps create a better organized project that meets all the stakeholders' interests. A list of stakeholders is included in the project team directory.
- Determine **ALL** of their requirements. This is neither easy nor fast, but the project manager must make every effort to obtain all the requirements before the work begins. Do you try to do this? How hard do you really try? Most project managers do not make the attempt.

To realize why this is important, think about the effects of starting a project without all the requirements. Those effects would likely include changes, delay and possible failure. How would it look if you had to say to your manager, "I did not know Kerry was a stakeholder on this project. Now that I know this, I need to extend the schedule to accommodate her needs, or to cut out of the project another stakeholder's needs." This is just bad project management.

Some people have said to me, "The nature of my project is that we will not know what we need for the second part until the first part is done." People will use any excuse to not do the right thing. You can imagine their faces when I say, "Well then of course you realize that you likely have two or more projects, not one, and you should be managing them that way."

There are many ways to make sure you have all the requirements; from just asking if you do, to requirements reviews, to telling people the negative consequences to the company and to the project of a requirement found later.

- Determine their expectations. These are things the stakeholders expect to happen to them, their department and the company as a whole. They tend to be much more ambiguous than stated requirements, or may be undefined requirements. They may be intentionally or unintentionally hidden. Expectations include such things as, "I expect that this project will not interrupt my department's work" or "I expect that the system will be dramatically improved as a result of the project." Naturally, expectations that go unidentified will have major impacts across all components of the "triple constraint." Expectations can be converted to requirements. A great project manager will make sure they identify expectations.
- Communicate with them. Stakeholders' communications requirements must be determined early. Their information needs are analyzed and considered throughout the project. They are included in project presentations and receive project information including progress reports, updates and changes to the project management plan.
- Manage their influence in relation to the requirements to ensure a successful project. Stakeholders have greater influence over the requirements early in the project, but changes to the project requirements can have negative overall consequences to the project throughout the project's life.

This is one of the few parts of the PMBOK® *Guide* that actually uses the word success. A key to your success is how you handle stakeholders. Stakeholders must be involved and their involvement must be managed by the project manager. That involvement can be either extensive or minor depending on the needs of the project and the performing organization. Therefore, the list of where the stakeholders can be involved can also be extensive. The following are the areas the exam focuses on. If you miss two or more of the following

answers, you should spend more time researching stakeholders in the *PMBOK® Guide*. Use a CD-ROM version of the *PMBOK® Guide* to search for the term stakeholders.

How the Project Manager Should Involve Stakeholders on the Project	Place ✓ Here If You Do It, Study Areas Unchecked
1. Determine all the stakeholders by name	
2. Determine all of their requirements	
3. Determine stakeholder expectations and turn them into requirements	
4. Manage and influence the stakeholders' involvement	
5. Get them to sign off that the requirements are finalized	
6. Assess their knowledge and skills	
7. Analyze the project to make sure their needs will be met	
8. Let them know what requirements will and what requirements will not be met and why	
9. Get and keep them involved in the project through assigning them project work such as the role of risk response owners	
10. Use them as experts	
11. Make sure the project communicates to them what they need to know, when they need to know it	
12. Involve them, as necessary, in change management and approval	
13. Involve them in the creation of lessons learned	
14. Get their sign-off and formal acceptance during project or project phase closing	

What if there is a difference between the requirements or other interests of the stakeholders? Such differences should generally be resolved in favor of the customer—the individual or organization that will use the product. Please see more about promoting interaction among stakeholders in the Human Resources, and Professional and Social Responsibility chapters.

Organizational Structure (page 32) A project does not operate in a vacuum. Projects are impacted by, and have impact on, the culture, management policies and procedures of the organizations they are part of. The best project managers look for these influences and manage them for the benefit of the project and the organization.

One of the main forms of influence is how the company is organized. This will dictate who the project manager goes to for help with resources, how communications must be handled and many other components of project management. So important is this that an answer to a question on the exam will change depending on the form of organization.

TRICKS OF THE TRADE The exam makes a habit of not telling you what form of organization you are in. When it does not say, assume matrix. If you remember this, you will get a few more questions right.

Organizational structures can be defined in terms of the project manager's level of authority. Many people have commented that they wished they had spent more time studying this topic. Questions on the exam related to organizational theory include:

- Who has the power in each type of organization — the project manager or the functional manager?
- Advantages of each type of organization
- Disadvantages of each type of organization

Functional This is the most common form of organization. The organization is grouped by areas of specialization within different functional areas (e.g., accounting, marketing and manufacturing). When you see the functional form of organization on the exam, think "silo." Projects generally occur within a single department. If information or project work is needed from another department, the request is transmitted up to the department head, who communicates the request to the other department head. Otherwise, communication stays within the project. Team members complete project work in addition to normal departmental work.

Projectized In a projectized organization, the entire company is organized by projects. The project manager has control of projects. Personnel are assigned and report to a project manager. When you see projectized on the exam, remember "no home." Team members complete only project work and when the project is over they do not have a department to go back to. They need to be assigned to another project or get another job with another employer. Communication generally occurs only within the project.

Matrix This form is an attempt to maximize the strengths and weaknesses of both the functional and projectized forms. When you see matrix forms of organization on the exam, think "two bosses." The team members report to two bosses: the project manager and the functional manager (e.g., VP Engineering, etc.). Communication goes from team members to both bosses. Team members do project work in addition to normal departmental work.

In a strong matrix, power rests with the project manager. In a weak matrix, power rests with the functional manager. The power of the project manager is comparable to that of a coordinator or expeditor. In a balanced matrix, the power is shared between the functional manager and the project manager.

In a weak matrix, the project manager's role might be more of a:

- **Project Expediter** The project expeditor acts primarily as a staff assistant and communications coordinator. The expeditor cannot personally make or enforce decisions.
- **Project Coordinator** Similar to the project expeditor except the coordinator has some power to make decisions, some authority, and reports to a higher-level manager.



A tight matrix has nothing to do with a matrix organization. It simply refers to locating the offices for the project team in the same room. Because it sounds similar to the other forms of organization, it is often used as a fourth choice for these questions.

Exercise Test yourself! You can expect questions about the advantages and disadvantages of each organizational form. Practice by listing your answers in the spaces below.

Functional

Advantages	Disadvantages

Projectized

Advantages	Disadvantages

Matrix

Advantages	Disadvantages



Answer Several potential answers are listed on the next page. When reading this list you might wonder "advantages or disadvantages compared to what?" Compare everything to functional. But remember, that you are assuming that you work in a matrix organization on the exam. In this type of question, they are asking you to compare to functional without saying "as compared to functional."

Functional

Advantages	Disadvantages
Easier management of specialists	People place more emphasis on their functional specialty to the detriment of the project
Team members report to only one supervisor	No career path in project management
Similar resources are centralized, the company is grouped by specialties	Project manager has little or no authority
Clearly defined career paths in areas of work specialization	

Projectized

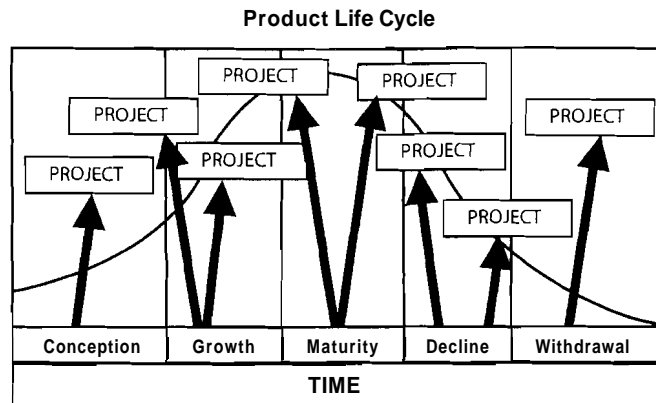
Advantages	Disadvantages
Efficient project organization	No "home" when project is completed
Loyalty to the project	Lack of professionalism in disciplines
More effective communications than functional	Duplication of facilities and job functions
	Less efficient use of resources

Matrix

Advantages	Disadvantages
Highly visible project objectives	Extra administration required
Improved project manager control over resources	More than one boss for project teams
More support from functional organizations	More complex to monitor and control
Maximum utilization of scarce resources	Tougher problems with resource allocation
Better coordination	Need extensive policies and procedures
Better horizontal and vertical dissemination of information than functional	Functional managers may have different priorities than project managers
Team members maintain a "home"	Higher potential for conflict

Life Cycle (page 23) A life cycle is a progression through a series of differing stages of development. There are two life cycles and one process you must know for the exam.

Product Life Cycle (page 23) This life cycle lasts from the conception of a new product to its withdrawal. A product can require or spawn many projects over its life. A project during conception might be to determine the customer's needs; a project during maturity might be to analyze the competition.



Project Life Cycle (page 19) You need two methodologies to complete a project; the first a project life cycle for what you need to do to do the work and the second a project management methodology or project management process for *managing* the project.

There are many different types of project life cycles depending on the industry you work in or the company's preferences. Some example life cycles are:

- Construction Feasibility, planning, design, production, turnover and startup
- Information systems Requirements analysis, high-level design, detailed design, coding, testing, installation, conversion and turnover to operations

The life cycle is sometimes referred to as the performing organization or department's methodology for projects. You need to know that this life cycle exists and you will see the phrase "project life cycle" on the exam but you should not expect detailed questions on project life cycles.

Project Management Process The project management process includes the initiating, planning, executing, monitoring and controlling, and closing process groups and is described in the next chapter.

Practice Exam

Project Management Framework

NOTE: If you have PM *FASTrack*®, RMC's PMP exam simulation software, you will save time, learn more, and get automatic scoring of your tests plus about 1,000 more questions by using that program rather than the questions in this book!

1. Four project managers are having lunch together and discussing their projects. Most of the time they are just complaining about how hard projects are to manage in their company. Some complain about the stakeholders and the number of changes they cause. Others talk about how hard it is to get people to cooperate and perform. One project manager wants to focus on the advantages of the matrix type organization they all work in for their projects. Which of the following would he mention?
 - A. Improved project manager control over resources
 - B. More than one boss for project teams
 - C. Communications are easier
 - D. Reporting is easier
2. Two project managers have just realized that they are in a weak matrix organization and that their power as project managers is quite limited. One figures out that he is really a project expeditor and the other realizes he is really a project coordinator. How is a project expeditor different from a project coordinator?
 - A. The project expeditor cannot make decisions.
 - B. The project expeditor can make more decisions.
 - C. The project expeditor reports to a higher-level manager.
 - D. The project expeditor has some authority.
3. In a projectized organization the project team:
 - A. reports to many bosses.
 - B. has no loyalty to the project.
 - C. reports to the functional manager.
 - D. will not always have a "home."
4. A project manager is trying to complete a software development project, but cannot get enough attention for the project. Resources are focused on completing process-related work and the project manager has little authority to properly assign resources. What form of organization must the project manager be working in?
 - A. Functional
 - B. Matrix
 - C. Expediter
 - D. Coordinator
5. A project manager has very little project experience, but he has been assigned as the project manager of a new project. Because he will be working in a matrix organization to complete his project, he can expect communications to be:
 - A. simple.
 - B. open and accurate.
 - C. complex.
 - D. hard to automate.

6. A project team member is talking to another team member and complaining that so many people are asking him to do things. If he works in a functional organization, who has the power to give direction to the team member?
 - A. The project manager
 - B. The functional manager
 - C. The team
 - D. Tight matrix

7. Who has the MOST power in a projectized organization?
 - A. The project manager
 - B. The functional manager
 - C. The team
 - D. They all share power

8. All of the following are characteristics of a project EXCEPT:
 - A. Temporary
 - B. Definite beginning and end
 - C. Interrelated activities
 - D. Repeats itself every month

9. All of the following are parts of the team's stakeholder management effort EXCEPT?
 - A. Giving stakeholders extras
 - B. Identifying stakeholders
 - C. Determining stakeholders' needs
 - D. Managing stakeholders' expectations

10. A manager and the head of engineering discuss a change to a major work package. After the meeting, the manager contacts you and tells you to complete the paperwork to make the change. This is an example of:
 - A. management attention to scope management.
 - B. management planning.
 - C. a project expediter position.
 - D. a change control system.

11. The project is in the planning process group when three stakeholders come to the project manager asking for information on the company's new project management methodology, where it came from and why it is different from how they manage projects. These stakeholders are also friends of the project manager and the entire group has worked together for years. The project is using some new terms like "corrective action" that are making some stakeholders nervous as they are unsure if the way the project will be managed is going to change along with new terms. What should the project manager do?
 - A. Advise the stakeholders that he will keep them in the communication loop for the project.
 - B. Supply a list of new terms and their definitions.
 - C. Notify the project management office.
 - D. Make sure he maintains his authority as the project manager even though they are friends.

12. A project manager is managing his second project. It started one month after the first and both are ongoing. Though his first project is small, this one seems to be growing in

- size every day. As each day passes, the project manager is beginning to feel more and more in need of help. The project manager has recently heard that there was another project in the company last year that is similar to his second project. What should he do?
- A. Contact the other project manager and ask for assistance.
 - B. Obtain historical records and guidance from the PMO.
 - C. Wait to see if the project is impacted by the growth in scope.
 - D. Make sure the scope for the project is agreed to by all the stakeholders.
13. The project has been going well, except for the number of changes being made. The project is being installed into seven different departments within the company and will greatly improve departmental performance when operational. There are 14 project management processes selected for use on this project. The project manager is a technical expert as well as having been trained in communications and managing people. Which of the following is the MOST likely cause of the project problems?
- A. The project manager was not trained in understanding the company environment.
 - B. The project should have more management oversight since it will result in such great benefits to the company.
 - C. The project should have used more of the project management processes.
 - D. Some stakeholders were not identified.
14. The project life cycle differs from the product life cycle in that the project life cycle:
- A. does not incorporate a methodology.
 - B. is different for each industry.
 - C. can spawn many projects.
 - D. describes project management activities.
15. Stakeholders can be identified in which project management process groups?
- A. Initiating, planning, executing, monitoring and controlling, and closing
 - B. Initiating and planning
 - C. Planning and monitoring and controlling
 - D. Monitoring and controlling and closing
16. Management by objectives works only if:
- A. it is supported by management.
 - B. the rules are written down.
 - C. the project does not impact the objectives.
 - D. the project includes the objectives in the project charter.
17. Your management has decided that all orders will be treated as “projects” and that project managers will be used to update orders daily, resolving issues and ensuring that the customer formally accepts the product within 30 days of completion. Revenue from the individual orders can vary from U.S. \$100 to U.S. \$150,000. The project manager will not be required to perform planning or provide documentation other than daily status. How would you define this situation?
- A. Because each individual order is a “temporary endeavor,” each order is a project.
 - B. This is program management since there are multiple projects involved.
 - C. This is a recurring process.
 - D. Orders incurring revenue over \$100,000 would be considered projects and would involve project management.

Project Management Framework Answers

1. Answer A
Explanation Remember that if the question doesn't state what it is comparing to, it is comparing to a functional organization.
2. Answer A
Explanation The project coordinator reports to a higher-level manager and has authority to make some decisions. The project expediter has no authority to make decisions.
3. Answer D
Explanation The main drawback of the projectized organization is that at the end of the project, the team is dispersed but they do not have a functional department (home) to which to return.
4. Answer A
Explanation In a functional organization, the project manager has the least support for the project and has little authority to assign resources. Choices C and D are forms of weak matrix.
5. Answer C
Explanation Because a project done in a matrix organization involves people from across the organization, communications are more complex.
6. Answer B
Explanation In a functional organization, the functional manager is the team member's boss and probably also the project manager's boss.
7. Answer A
Explanation In a projectized organization, the entire company is organized by projects, giving the project manager the most power.
8. Answer D
Explanation Choice D implies that the whole project repeats every month. Generally, the only things that might repeat in a project are some activities. The whole project does not repeat.
9. Answer A
Explanation Giving stakeholders extras is gold plating (see the Quality chapter). This is not effective stakeholder or quality management.
10. Answer C
Explanation This is an example of a project expediter position because you are not evaluating the change, looking for impacts, etc. You are merely implementing others' requests. In this case, you are acting as the project expediter and the manager is acting as the project manager.
11. Answer C
Explanation This is one of the first times you are seeing a question which can be thought of having more than one right answer. It does not. There are many things

that the project manager can do, but what should be done? The company policies are managed by the project management office and the project manager should make sure the stakeholders have clear information and send them right to the authority on company policies for project management.

12. Answer B

Explanation Here again, there are many things the project manager could do. Choice A is not the best choice, as the other project manager might not be an experienced mentor. His advice might not be adequate to help this project manager. Choice C is reactive, while a project manager should be proactive. Choice D is not the best choice. It would be helpful, but does not specifically address the issues in this situation. If the PMO is contacted, the project manager can receive the knowledge of many project managers, historical information from many projects and have the assistance of someone whose job it is to help.

13. Answer D

Explanation Once again, it is important here to look for the choice that would solve the real problem. There is no reason to think that training (choice A), management oversight (choice B), or a need for more processes (choice C) are factors contributing to the number of changes. The root cause would be that stakeholders were missed and therefore their requirements were not found. Those stakeholders are now causing changes to accommodate their needs. The best choice is D.

14. Answer B

Explanation The project life cycle does incorporate a methodology—for doing the work—so choice A cannot be best. It is the product life cycle that spawns many projects, so choice C cannot be best. Project management activities are described in the project management process, so choice D cannot be best. The project life cycle is different for each industry and so choice B is the best answer.

15. Answer A

Explanation Stakeholders can be identified throughout the project management process groups. However, the earlier stakeholders are identified, the better for the project. If all of the stakeholders' needs and requirements are taken into account before plans are finalized and project work is begun, fewer changes will be needed later in the project, when they will be more costly.

16. Answer A

Explanation The best answer is the need for management to support the objectives.

17. Answer C

Explanation Because orders are numerous and of short duration, this situation is a process, not a project.

Quicktest

- What is done during each of the project management processes
 - Initiating
 - Planning
 - Executing
 - Monitoring and controlling
 - Closing
- What you do not do in your real world during each of the project management processes

Whereas the project life cycle describes what you need to do the work, the project management process describes what you need to do to manage the project. It includes:

- Initiating
- Planning
- Executing
- Monitoring and controlling
- Closing

For small projects this might be exactly the process you need to use to manage your projects. For large projects, this process may be repeated for each phase of the project life cycle (page 69, Figure 3-12). The processes frequently overlap during the life of the project (page 68, Figure 3-11).

Many quality experts follow the Plan-Do-Check-Act cycle to improve the quality of processes. This cycle can be correlated to the project management processes as follows:

- Initiating = Start the cycle
- Planning = Plan
- Executing = Do
- Monitoring and controlling = Check and act
- Closing = Ends the cycle

You know a lot about project management already. Want to make sure you do not waste hours of studying? This chapter cuts to the chase by summarizing huge volumes of information about project management. Sound good? It may be this chapter that gets you past the exam.

Take this chapter extremely seriously and look for gaps in your knowledge as you complete the chapter. It is also important to write in the book as you go. For reasons that cannot be explained here, it is not smart to use a separate piece of paper. Write in the book.

To pass the PMP Exam, you must understand the project management process groups and knowledge areas. On the next pages, you will find several ways to help you understand the overall project management process, as well as the relationship between process groups and knowledge areas. Go through them now and come back to them as you study.

TRICKS OF THE TRADE **Rita's Process Chart** Since the first groundbreaking edition of this book in 1998, the following exercise has been one of the key things helping people pass the exam. There are over 50 questions on the exam about the process of project management; yet answering these questions can be very confusing. This exercise is designed to put it all into perspective.

NOTE: The chart is a trick for getting more questions right on the exam. It is a shortcut to help you gain a better understanding of project management, with little memorization. The chart is a consolidated version of the exercises you will complete in the rest of this chapter. It will help you to focus on the key items you need to know for the exam. Know this chart for the exam as follows:

- Understand the overall project management process (a PMI-ism)
- Find terms you do not know and learn what they are by looking them up in this book
- UNDERSTAND the project management process groups, when each should be done, and possible looping between the process groups
- Complete the Rita's Process Game that follows at least three times
 - Understand what each item is
- Understand what column each item goes in
- MEMORIZE the specific order of the planning process. Knowing the planning column **IN THIS ORDER** can get you a large number of questions right on the exam.

Be prepared for questions that describe situations and ask you to pick the next thing to do or to name the project management process group you are in.

Rita's Process Chart

Initiating	Planning	Executing	Monitoring & Controlling	Closing
Select project manager	Determine how you will do planning — part of management plans	Acquire final team	Measure against the performance measurement baselines	closure procedures
Determine company culture and existing systems	Create project scope statement	Execute the PM plan	Measure according to the management plans	Complete contract closure
Collect processes, procedures	Determine team	Complete product scope	Determine variances and if they warrant corrective action or a change	Confirm work is done to requirements
historical information	Create WBS and WBS dictionary	Recommend changes and corrective actions	Scope verification	Gain formal acceptance of the product
Divide large projects into phases	Create activity list	Send and receive information	Configuration management	Final performance reporting
Identify stakeholders	Create network diagram	Implement approved changes, defect repair, preventive and corrective actions	Recommend changes, defect repair, preventive and corrective actions	Index and archive records
Document business need	Estimate resource requirements	Continuous improvement	Integrated change control	Update lessons learned knowledge base
Determine project objectives	Estimate time and cost	Follow processes	Approve changes, defect repair, preventive and corrective actions	Hand off completed product
Document assumptions and constraints	Determine critical path	Team building	Risk audits	Release resources
Develop project charter	Develop schedule	Give recognition and rewards	Manage reserve	
Develop preliminary project scope statement	Develop budget	Hold progress meetings	Use issue logs	
	Determine quality standards, processes and metrics	Use work authorization system	Facilitate conflict resolution	
	Determine roles and responsibilities	Request seller responses	Measure team member performance	
	Determine communications requirements	Select sellers	Report on performance	
	Risk identification, qualitative and quantitative risk analysis and response planning		Create forecasts	
	Iterations — go back		Administer contracts	
	Determine what to purchase			
	Prepare procurement documents			
	Finalize the "how to execute and control" aspects of all management plans			
	Create process improvement plan			
	Develop final PM plan and performance measurement baselines			
	Gain formal approval			
	Hold kickoff meeting			



Notes on the Chart Notice in the planning column of the Process Chart the word "iterations." This is an important concept. One creates a WBS, and the other items listed on the table above "iterations," to the best of his ability. As the project evolves, many of the initial plans will need to be modified or added to. For example, it is only after completing risk management that the WBS and the other items can be finalized. A risk response strategy (see the Risk chapter) might be to hire a contractor. That work is then added to the WBS. One might work with discretionary dependencies (see the Time chapter) in order to decrease some risk and thereby change the network diagram. The important thing to remember is that planning should lead to a realistic, bought into, and approved project management plan. Iterations help you get there.

Planning is the only project management process group that has a specific order of activities. However, you should also know that release resources is the last activity in the closing process group.

Team building, risk identification, risk response planning and integrated change control are focused on where they are placed in the chart. These activities can start in project initiating and do not end until project closing.

Notice that corrective actions (not preventive actions) and changes can be recommended or requested in both the executing and monitoring and controlling process groups. The processes of quality assurance, information distribution, select sellers in project executing, and scope, schedule, quality and cost control in monitoring and controlling result in requested changes. The changes are then evaluated and approved or rejected as part of integrated change control.

Rita's Process Game The following pages contain the pieces of the Rita's Process Game. Cut them out and practice putting them into the correct process groups at least three times, on your own or in a group. This will help test your knowledge of what will be discussed throughout this chapter. When you think they are all in the correct process groups, put the planning processes in order. Lastly, check your answers using the chart on the previous page.

I have said that you must understand project management to pass the test. If you do not understand many of the items or you do not agree with the order in planning, you are lacking a basic understanding of project management. In that case, you might want to consider additional project management training before taking the exam.

Select Project Manager	Determine How You Will Do Planning—Part of Management Plans	Acquire Final Team
Measure Against the Performance Measurement Baselines	Develop Closure Procedures	Complete Contract Closure
Measure According to the Management Plans	Execute the Project Management Plan	Identify Stakeholders
Collect Historical Information	Divide Large Projects into Phases	Release Resources
Document Business Need	Determine Project Objectives	Document Assumptions and Constraints

Intentionally
left
blank

Determine Team	Develop Project Charter	Develop Preliminary Project Scope Statement
Create Project Scope Statement	Create WBS and WBS Dictionary	Create Activity List
Create Network Diagram	Estimate Resource Requirements	Estimate Time and Cost
Determine Critical Path	Develop Schedule	Develop Budget
Determine Quality Standards, Processes and Metrics	Determine Roles and Responsibilities	Determine Communications Requirements

Intentionally
left
blank

Risk Identification, Qualitative and Quantitative Risk Analysis and Risk Response Planning	Iterations — Go Back	Determine What to Purchase
Prepare Procurement Documents	Finalize the "How to Execute and Control" Aspects of All Management Plans	Create Process Improvement Plan
Develop Final Project Management Plan and Performance Measurement Baselines	Gain Formal Approval	Hold Kickoff Meeting
Complete Product Scope	Recommend Changes and Corrective Actions	Send and Receive Information
Implement Approved Changes, Defect Repair, Preventive and Corrective Actions	Continuous Improvement	Follow Processes

Intentionally
left
blank

Team Building	Give Recognition and Rewards	Hold Progress Meetings
Use Work Authorization System	Request Seller Responses	Select Sellers
Determine Variances and Whether They Warrant Corrective Action or a Change	Scope Verification	Configuration Management
Recommend Changes, Defect Repair, Preventive and Corrective Actions	Integrated Change Control	Approve Changes, Defect Repair, Preventive and Corrective Actions
Risk Audits	Manage Reserves	Use Issue Logs

Intentionally
left
blank

Facilitate Conflict Resolution	Measure Team Member Performance	Report on Performance
Create Forecasts	Administer Contracts	Confirm Work Is Done to Requirements
Gain Formal Acceptance of the Product	Final Performance Reporting	Index and Archive Records
Update Lessons Learned Knowledge Base	Hand Off Completed Product	

Intentionally
left
blank

The What-Comes-Before Game Here is another game to see if you really have it. Only do this game after you have completed Rita's Process Game at least three times. Then you will really be able to judge if you know this.

Instructions Name the project planning process that comes before each of the following items.

Planning	What Comes Before?
Create network diagram	
Prepare procurement documents	
Create project scope statement	
Create work breakdown structure (WBS) and WBS dictionary	
Determine critical path	
Develop budget	
Estimate time and cost	
Gain formal approval	
Hold kickoff meeting	
Determine quality standards, processes and metrics	
Determine communications requirements	
Iterations	
Create process improvement plan	
Determine roles and responsibilities	
Risk identification, qualitative and quantitative risk analysis and risk response planning	
Estimate resource requirements	
Create activity list	

Answer to the What-Comes-Before Game

Planning	What Comes Before?
Create network diagram	Create activity list
Prepare procurement documents	Determine what to purchase
Create project scope statement	Determine how you will do planning
Create work breakdown structure (WBS) and WBS dictionary	Determine team
Determine critical path	Estimate time and cost
Develop budget	Develop schedule
Estimate time and cost	Estimate resource requirements
Gain formal approval	Develop final PM plan and performance measurement baselines
Hold kickoff meeting	Gain formal approval
Determine quality standards, processes and metrics	Develop budget
Determine what to purchase	Iterations
Determine communications requirements	Determine roles and responsibilities
Iterations	Risk identification, qualitative and quantitative risk analysis, and risk response planning
Create process improvement plan	Finalize the "how you will execute and control" aspects of all management plans
Determine roles and responsibilities	Determine quality standards, processes and metrics
Risk identification, qualitative and quantitative risk analysis and risk response planning	Determine communications requirements
Estimate resource requirements	Create network diagram
Create activity list	Create work breakdown structure (WBS) and WBS dictionary

How to Use the Rest of This Chapter For many, this is the hardest chapter in the book and uncovers the most gaps in their knowledge. As you read this chapter, you will see many exercises. They are designed to help you explore what needs to be done as a project manager during each of the project management process groups. Spend about two to five minutes trying to answer each exercise and about five to fifteen minutes reviewing the answers to each exercise. The point of the exercises is to help you discover gaps in your project management knowledge. It is NOT to have you regurgitate long lists of data. The lists do not require memorization (unless indicated), but rather they require an understanding of what a project manager should be doing in the real world. Take these exercises seriously, as the exam includes common project management errors as choices and will focus on things most people don't know they should be doing. Any gaps in your knowledge should be thought through and researched.

You should read each chapter in this book more than once. On your second time through this chapter, don't try to recreate the complete lists in each answer. Just make sure you fill in the gaps you discover the first time through.

Initiating Process Group Essentially, the initiating processes formally start a new project or project phase by incorporating all the needs of the organization into the project charter and preliminary project scope statement.

The initiating processes can begin with the project in varying states. Sometimes feasibility studies have been completed, and sometimes not. Sometimes the projects are selected from a list of possible projects before project initiation, and sometimes this is done within the initiating process group. In any case, the project charter and the preliminary project scope statement are the major outputs of this process group.

Inputs to the Initiating Process Group You do not have to memorize inputs. Let me help prove it. Here is another trick. Try this exercise.

Exercise What do you think you would need to know or have before you initiate a project?

TRICKS OF THE TRADE: **Answer** NOTE: You may wish the answers to exercises were not listed right after the questions. If this bothers you, simply keep a blank piece of paper available to cover the answer as you complete each exercise. My analysis shows that having the answers right after the questions helps you more than it hurts.

If you know what the initiating processes are, watch how easy the inputs are to guess.

- Business need
 - Product description or product scope description describes the product requirements as they are known up to this point. In other words, what is the project being asked to do?
 - How the project fits into or supports the company's strategic plan
- Who are likely to be stakeholders
 - Contracts, if the work is done under a contract
- Industry standards
- Company change process
- How the company does business; defined processes and procedures
 - Past relationships with the sponsor of the project, likely stakeholders and team
- Templates from past projects
 - Historical WBSs
 - Historical estimates
 - What is going on in the company today? What are the major projects? What might their impact be on this project?
- The company's future
- The company's culture
- People who may be good team members

How many of the items on this list were also on yours? I think you had a lot of them. Now let's move further and consider what should be done during the initiating processes, by completing the next exercise.

Exercise What are the specific ACTIONS required to complete the project initiating processes?

Answer If you are thinking only in terms of the PMBOK® *Guide*, you come up with the following:

- Develop project charter (Integration chapter)
- Create preliminary project scope statement (Integration chapter)

This will not be enough to help you pass the exam. You need a more detailed understanding of what really needs to be done in the initiating process group (actions), and to find out if there are any of these you do not know, or have never done. Then you can fill in your gaps and pass the exam.

As you check your answers with the following list, remember, what needs to be done depends on the specific project and the industry. Make sure you understand the following as being done during the initiating process group.

Action	Place ✓ Here If You Do It, Study Areas Unchecked
1. Select a project from a list of possible projects	
2. Select the project manager	
3. Determine the authority of the project manager	
4. Collect historical information	
5. Divide large projects into phases	
6. Identify high-level stakeholders, their influences and their risk tolerances	
7. Turn stakeholder needs, wants and expectations into requirements	
8. Make sure business needs have been documented	
9. Document assumptions	
10. Document constraints (e.g., resources, schedule, cost)	
11. Ensure the product scope is as final as practical	
12. Understand how the project fits into the organization's strategic objectives	
13. Determine project objectives and product objectives	
14. Facilitate the resolution of conflicting objectives	
15. Get familiar with the company culture and structure as it relates to the project	
16. Find existing processes and standards	
17. Understand how the organization does business and what procedures and policies are already in place to use on the project	
18. Do planning using the project planning process on a high-level basis	
19. Complete order of magnitude estimating of the project schedule and budget	
20. Determine what form the project charter will take, why, etc.	
21. Coordinate project initiating efforts with stakeholders and the customer	
22. Work with the customer and others to determine acceptance criteria and what is and is not in the project	
23. Determine the initial project organization	
24. Document any risks already known	
25. Determine any milestones needed	
26. Determine how scope will be controlled	
27. Finalize the project charter	
28. Obtain formal approval of the project charter	
29. Create the preliminary project scope statement	

You may notice that many of the items in the previous table (e.g., estimates, assumptions, constraints, product scope, etc.) are begun in the initiating process group and refined later in the project management process. Here are some other items needing further clarification.

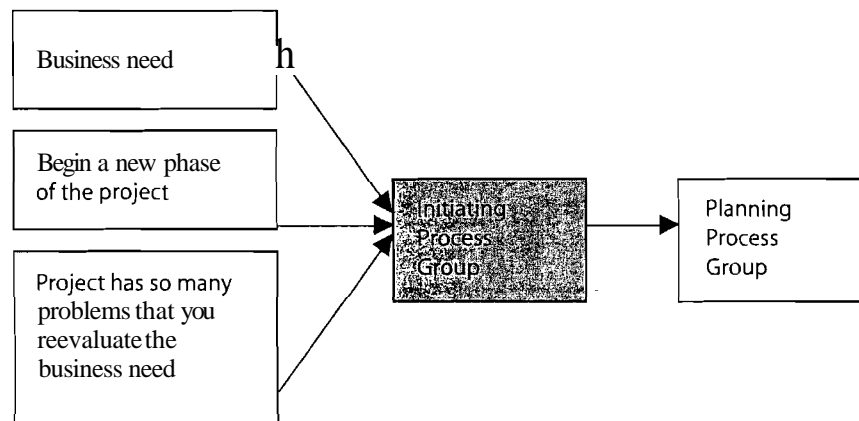
Project Manager Assigned You should notice in the previous exercise that the project manager is assigned early in the process. This means that the project manager is involved in the project initiating processes. Are you? Assume you are involved and make sure you understand what is going on during the initiating processes.

Business Need Do you know why your project was started? Does it matter? The reason the project was started will be taken into account throughout the project. It will influence how the project is planned, what changes are allowed, and the design of the scope of the project. Projects are initiated for many reasons. You need to know your reasons.

High-Level Planning Is Done During the Initiating Processes The other important thing to notice in the previous exercise is that high-level planning may be done during the initiating processes. Such planning may include creating a high-level WBS, order of magnitude estimating, preliminary project scope statement and high-level risk identification. How else can you come up with project objectives of schedule, cost, scope, etc.?

More discussion of unrealistic schedules is available on the Free Tips page of the RMC Web site.

The following diagram shows reasons the project initiating process is begun.



— Planning Process Group How much better would your last project be if you could magically do it over again? This is the power of planning, because it entails walking through the project and getting it organized before it is actually done. It is during project planning, in addition to when the work is being done, that resources, time and money can be saved.

Project planning determines if the project charter can or cannot be done, as well as how the project will be accomplished; addressing all appropriate project management processes and knowledge areas. This means that the project manager and the project team will determine what processes in the PMBOK® *Guide* are appropriate for the needs of the project, to avoid wasting project resources on activities that are not relevant to the particular project.

Exercise What are the specific ACTIONS required to complete the project planning process group?

Answer If you are thinking only in terms of the PMBOK® Guide, you come up with the following:

- Develop project management plan (Integration chapter)
- Scope planning (Scope chapter)
- Scope definition (Scope chapter)
- Create WBS (Scope chapter)
- Activity definition (Time chapter)

This will not be enough to help you pass the exam. (Heard this before?) You need a more detailed understanding of what really needs to be done in the planning process group (actions), and to find out if there are any of these you do not know, or have never done.

As you check your answers with the following list, note which items you do in the real world. Make sure you understand the following as being done during the planning process group.

NOTE: Do not fall into the trap of losing focus when you are working through these long lists. The lists purposely jump around and are intended to contain a lot of information to save you the time of reading hundreds of pages of boring text. Each list should take you about 15 minutes to think through.

Action	Place ✓ Here If You Do It, Study Areas Unchecked
1. Determine how you will plan scope, time, cost, risk, quality, process improvement and procurement and put that into beginnings of management plans for each knowledge area	
2. Refine requirements from project initiating so they are more specific	
3. Create a description of the project deliverables and the work required to complete those deliverables (project scope statement)	

Action	Place ✓ Here If You Do It, Study Areas Unchecked
4. Use the project scope statement to gain approval of the "final" scope from the stakeholders before further planning is done	
5. Determine team	
6. Break down the work into smaller, more manageable pieces (WBS)	
7. Create descriptions of each work package in a WBS dictionary so that the work can be understood by those assigned, with little gold plating	
8. Break down the work packages from the WBS into lists of activities, if necessary	
9. Sequence activities and determine predecessors and successors	
10. Estimate resource requirements	
11. Meet with managers to gain resource commitments	
12. Decide what level of accuracy is needed for estimates	
13. Have those working on the activities estimate time and cost	
14. Determine how long the project will take without compressing the schedule	
15. Develop preliminary schedule model	
16. Develop preliminary budget	
17. Determine quality standards and what metrics will be used to measure quality performance	
18. Determine what processes should be followed on the project to reduce the need to supervise work, to improve quality and to make use of standards	
19. Clearly determine roles and responsibilities so all team members and stakeholders know what their roles are on the project; what work they will need to do	
20. Determine what information you will need from other projects and what information you can send to other projects	
21. Work with all the stakeholders to understand their communications requirements	
22. Complete risk identification, qualitative and quantitative risk analysis and risk response planning	
23. Iterations—go back, in order to work toward a project management plan that is bought into, approved, realistic and formal	
24. Determine what to purchase	
25. Prepare procurement documents	
26. Look for positive and negative interactions from and to other projects that can affect this project	
27. Finalize how you will execute and control aspects of all management plans	
28. Plan ways to measure project performance, measurements to be used, when they will be used and how they will be interpreted	
29. Determine what meetings, reports and other activities you will use to control the project to the project management plan	

Action	Place ✓ Here If You Do It, Study Areas Unchecked
30. Determine how you will improve the processes in use on the project	
31. Develop final project management plan and performance measurement baselines by performing schedule network analysis, looking for options and confirming that project objectives can be met	
32. Gain formal approval of the project management plan from the sponsor, team and managers of resources	
33. Hold kickoff meeting with all the key stakeholders, team, team members' managers and the customer to make sure everyone is on the same page and to gain buy-in	

The result of the planning processes is a project management plan. Project planning is iterative. Each process above may use the results of the previous process, and each process may affect or cause changes to the previous processes. The idea, in the real world, is to follow these processes in the planning process group, attempting to complete each one as fully as possible. Then, after risk identification, qualitative and quantitative risk analysis and risk response planning, go back to finalize all the components of the project management plan. This process of planning saves time and is efficient. Can you guess why iterations start after risk management? Because it is only after risk management is completed that the final cost and schedule can be determined. Risk management could also result in changes to the resources, when they are used, in what sequence activities are performed, and almost all other parts of the planning process group.

Did the last two sentences make sense? If so, you are in excellent shape. If not, you will need to read the Risk chapter of this book carefully to find out what I mean and why those sentences should make sense.

Notice also the use of management plans in the previous list. Do you remember that these are PMI-isms? So many times project managers jump right into whatever they are doing without thinking about it beforehand. Such actions lead to inefficiencies, rework, mistakes, conflict, needless overtime and just plain bad project management. Better project managers think about things before they do them. Take a more formal approach to considering "How will I do this?" before doing the work. The answer to this question is a management plan.

There are many components to management plans but generally they consist of a "How will I go about planning scope, schedule, etc.?" and "How will I manage and control scope, schedule, etc., now that I have planned what needs to be done?" Both answers are determined in the planning process group. For clarity, the previous exercise groups management plans together instead of listing each management plan. It also lists the iterations of the management plans by separating them into the planning, management and control pieces. See more about management plans in the Integration chapter.

Another important aspect of planning is that the amount of time spent in the planning process group should be related to the needs of the project. A project where the schedule

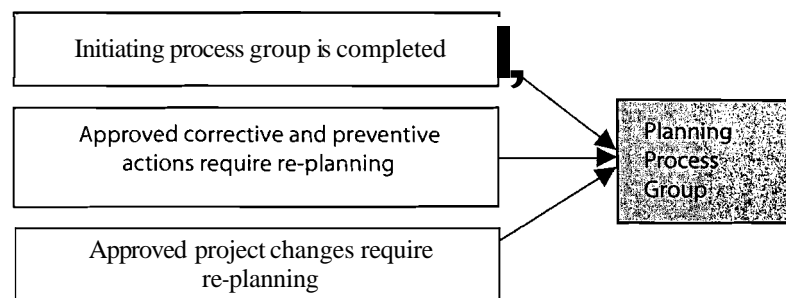
needs to have a high level of confidence will require more planning. A project with a low priority will require less planning.

Imagine that you have chosen to organize the project by phases (test phase, install phase, etc.) It might not be possible to plan each phase to a detailed degree until the phase before is almost completed. This is called "rolling wave planning." Even though each part of the "project" is called a phase, each phase could be, and maybe should be, planned as a project with its own charter, scope statement, WBS, etc.

It also needs to be decided what level of detail the project should be planned to. Many projects have enough information to plan to the activity level right away, others can only be planned to a work package level or even some higher level until more is known about the project. Projects that require more control to meet the project objectives of time or cost may need to be planned to a more detailed level. Those that do not need so much control can be planned to a lesser degree of detail.

Who is involved in the planning processes? Everyone! The project management plan is compiled by the project manager with input from stakeholders. Historical records from previous projects, company policies, magazine articles about projects and other such information may also be utilized in planning the project.

When are we in the planning process group? Project planning does not just occur when the project is beginning. We enter project planning for various reasons illustrated by the diagram below.



See the rest of the book for descriptions of each of the processes in the planning process group, particularly the Integration chapter for the project manager's role in creating a project management plan.

Executing Process Group The purpose of the executing processes is to complete work in the project management plan and to meet the project objectives. This is the "do" step of the plan-do-check-act cycle. The focus is on managing people, following processes and distributing information. It is essentially a guiding, proactive role accomplished by constant referral back to the project management plan.

Think about project planning again. Do you create a project management plan that is realistic and approved? Does your project management plan contain the same things that were previously described, such as management plans? Probably not. Therefore, the questions in this area can be impossibly hard and tricky as they will be asking about managing a project assuming proper project management planning was done. For the

exam, get your mind around the critical difference planning provides and assume you have properly planned your projects in the real world.

Exercise Imagine you are about to begin the project executing process group. What type of ACTIONS must be taken?

Answer If you are thinking only in PMBOK" Guide terms, you come up with the following as part of the executing process group:

- Direct and manage project execution (Integration chapter)
- Perform quality assurance (Quality chapter)
- Acquire project team (Human Resources chapter)
- Develop project team (Human Resources chapter)
- Information distribution (Communications chapter)
- Request seller responses (Procurement chapter)
- Select sellers (Procurement chapter)

In order to pass the exam, you need an extremely good understanding of what it takes to manage a project. You also need to understand what management is like, assuming you have a project management plan that is bought into, approved, realistic and formal. Since many people do not have such project management plans, questions relating to the executing process group (as well as the monitoring and controlling process group which follows) are the worst scoring areas.

As you check your answers with the following list, note which items you do in the real world. Then you can fill in your gaps and pass the exam.

NOTE: Here is another long list. Keep focused and spend at least five to 15 minutes thinking this through.

Action	Place ✓ Here If You Do It, Study Areas Unchecked
1. Set and manage the expectations of all stakeholders	
2. Ensure common understanding of the work	
3. Implement the original project management plan or the project management plan that was revised as a result of control activities	

Action	Place ✓ Here If You Do It, Study Areas Unchecked
4. Complete work packages	
5. Collect and document lessons learned	
6. Establish and manage communication channels	
7. Evaluate the team's effectiveness as a team	
8. Implement approved changes, corrective actions, preventive actions and defect repair	
9. Implement quality assurance procedures	
10. Produce project reports	
11. Hold team building activities	
12. Follow ground rules at team meetings	
13. Obtain needed training for team members	-
14. Distribute information	
15. Remove roadblocks	
16. Achieve work results that meet requirements	
17. Meet with managers to reconfirm resource commitments	
18. Keep managers apprised of when their resources will be needed on the project	
19. Commit project resources in accordance with the project management plan	
20. Manage project progress	
21. Guide, assist, communicate, lead, negotiate, help, coach	
22. Utilize your technical knowledge	
23. Authorize when work on work packages should be done using a work authorization system	
24. Hold progress meetings	
25. Send and receive information	
26. Focus on preventing problems rather than just dealing with them as they arise	
27. Make sure all team members have the skills, information and equipment needed to complete their work	
28. Focus on looking for exceptions to the approved project management plan rather than checking up on every team members' work or babysitting	
29. Recommend changes and corrective actions to be handled in integrated change control	
30. Follow organizational policies, processes and procedures	
31. Increase the effectiveness of processes	
32. Recommend actions to increase the effectiveness of the performing organization	
33. Determine if project activities comply with processes, policies and procedures	
34. Ensure continued agreement to the project management plan	

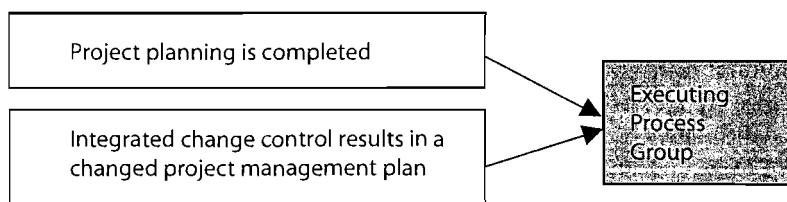
Action	Place ✓ Here If You Do It, Study Areas Unchecked
35. Keep everyone focused on completing the project to the charter, requirements or product scope, project scope, business case and project management plan	
36. Reevaluate the project's business case when a severe problem occurs	
37. Solve problems	
38. Implement the recognition and reward system created during the planning processes	
39. Determine team members who could not be named during the planning processes	
40. Implement approved process improvements	
41. Implement contingency plans (created in project planning), or workarounds as required	
42. Request seller responses to procurement documents	
43. Review bids and quotes, and select sellers	
44. Expend and monitor project funds	

Did you include such items as asking for percent complete and dealing with problems? Haven't you realized that percent complete may not be worthwhile, that it is too subjective, and that a project manager should be spending more time preventing problems than dealing with them?

Did you list meetings? I hope you were not thinking about "go around the room and report what you have done" type meetings. If so, you might not be able to pass the exam, because you have not realized that status can be collected through other means. Occasions when the team gets together are too important to just collect status. How about reviewing risks or upcoming contingency plans? Status meetings can cause you to lose buy-in from your team for wasting their time. If you need more on this, I encourage you to visit the Free Tips area of our Web site.

TRICKS OF THE TRADE Keep the phrases "Work to the project management plan," "Be proactive," "Adjust," and "Guide" in mind as you take the exam to make sure you are thinking like PMI.

The processes of project management are not always performed in the same sequence. Executing means executing the project management plan or the latest revised project management plan. The following diagram will illustrate when you enter project execution.



Therefore, you are always executing to the project management plan, but the plan might have changed over time.

— **Monitoring and Controlling Process Group** Monitoring and controlling means measuring the performance of the project to the project management plan, approving change requests, preventive actions and defect repair, and managing changes. Here is a reason that project monitoring and controlling is among the worst scoring process groups on the exam. You are expected to know how to control a project that has a real project management plan. If you spend most of your time having meetings where people go around the room and report on how their work is going, asking for percent complete, not sure if the project will meet its performance baselines and thinking that an unrealistic schedule should be blamed on management, you will have such difficulty on the exam that you might not even pass. These actions are indications of a project manager who is not managing appropriately.

The following exercise should help you get your mind around what you should be doing to monitor and control a project. Be very careful NOT to jump right to the answers. The value is in doing these exercises and finding gaps in your knowledge and experience, not just memorizing the answers. The result is that you will be a better project manager, not just pass an exam!

Exercise What are the specific ACTIONS required to complete the project monitoring and controlling process group?

Answer If you are thinking only in PMBOK® *Guide* terms, you come up with the following:

- Monitor and control project work (Integration chapter)
- Integrated change control (Integration chapter)
- Scope verification (Scope chapter)
- Scope control (Scope chapter)
- Schedule control (Time chapter)
- Cost control (Cost chapter)
- Perform quality control (Quality chapter)
- Manage project team (Human Resources chapter)
- Performance reporting (Communications chapter)
- Manage stakeholders (Communications chapter)
- Risk monitoring and control (Risk chapter)
- Contract administration (Procurement chapter)

The above listed items are described in the chapters of this book as referenced. They will not, however, be enough to help you pass the exam. You need a more detailed

understanding of what really needs to be done in the monitoring and controlling process (actions), and to find out if there are any of these you do not know, or have never done. Once again, read over the following list looking for gaps in your knowledge.

NOTE: Because this is one of the worst scoring knowledge areas, you should spend considerable time here. Do not lose focus as you read. Take a break in the middle of the list if you need to, and remember the list intentionally jumps around.

Action	Place ✓ Here If You Do It, Study Areas Unchecked
1. Measure project performance according to the measures in the management plans	
2. Measure against the performance measurement baselines	
3. Determine variances and if they warrant recommending a corrective action or change	
4. Exercise judgment to determine what variances are important	
5. Recommend changes, defect repair, preventive and corrective actions	
6. Approve changes, defect repair, preventive and corrective actions in integrated change control	
7. Facilitate conflict resolution using conflict resolution techniques	
8. Create forecasts	
9. Manage configuration	
10. Control schedule, cost and quality to their baselines	
11. Use issue logs	
12. Refine control limits	
13. Hold meetings regarding controlling the project	
14. Identify the root causes of problems	
15. Recommend updates to the project management plan	
16. Obtain formal acceptance of deliverables from the customer	
17. Identify the need for re-planning	
18. Manage the time and cost reserves	
19. Recalculate how much the project will cost and how long it will take	
20. Obtain additional funding when needed	
21. Hold periodic inspections	
22. Make decisions to accept or reject work	
23. Evaluate the effectiveness of implemented corrective actions	
24. Reassess the effectiveness of project control systems	
25. Spend time trying to improve quality	
26. Get information from stakeholders to determine if project controls need to be updated	
27. Identify and analyze trends	
28. Evaluate the effectiveness of risk responses in a risk audit	
29. Look for newly arising risks	

Action	Place ✓ Here If You Do It, Study Areas Unchecked
30. Reanalyze existing risks	
31. Use milestones as a project control feature	
32. Observe	
33. Measure individual team member performance	
34. Report on performance to all stakeholders	
35. Use variance reports to help correct small problems before they become serious	
36. Calculate estimate to complete	
37. Use and interpret earned value calculations	
38. Use quality control tools — inspection, Pareto charts, fishbone diagrams	
39. Do project performance appraisals	
40. Identify variances from the project management plan	
41. Control changes	
42. Ensure that only approved changes are implemented	
43. Work with the change control board	
44. Manage stakeholders	
45. Contract administration	
46. Hold status review meetings	

How have you been doing so far with the exercises in this chapter? Please keep in mind that the PMP exam is a test of experienced project managers. Chances are you know enough about project management if you checked most of the boxes in the previous exercises.

For the exam, assume:

- You have a real project management plan
- You have metrics for all project objectives already in place
- Your metrics cover all the objectives and are reasonable measures of how the project is performing
- You measure and the measurement gives you information on the status of the project

A project manager spends time and focused effort controlling scope, time, communications, risks, etc. Do you? Read over the following in order to get a better sense of what is control. Since these concepts overlap and repeat themselves, I am including them all here, to provide a better understanding of the overall monitoring and controlling process group. Control processes are also discussed in the other chapters of this book.

Scope Verification

- Inspect a deliverable
- Obtain formal acceptance of a deliverable from the customer
- Request changes
- Recommend corrective actions

Scope Control

- Manage actual changes

- Control impact of scope changes
- Recommend corrective actions
- Analyze variances
- Re-plan
- Recommend changes
- Adjust the scope baseline
- Document lessons learned

Schedule Control

- Follow change control system
- Measure schedule performance against the performance measurement baseline
- Manage actual changes
- Control impact of schedule changes
- Recommend corrective actions
- Request changes
- Analyze variances
- Document lessons learned
- Update project management plan
- Manage the time reserve
- Use earned value

Cost Control

- Follow change control system
- Measure schedule performance against the performance measurement baseline
- Manage actual changes
- Control impact of cost changes
- Recommend corrective actions
- Request changes
- Analyze variances
- Document lessons learned
- Update project management plan
- Update the cost baseline
- Recalculate the estimate at completion
- Obtain additional funding when needed
- Manage the budget reserve
- Use earned value

Perform Quality Control

- Hold periodic inspections
- Ensure authorized approaches and processes are followed
- Recommend corrective actions
- Make changes or improvements to work and processes
- Complete rework as needed to meet requirements
- Make decisions to accept or reject work
- Evaluate the effectiveness of implemented corrective actions
- Reassess the effectiveness of project control systems
- Improve quality

Manage Project Team

- Track and report individual performance
- Resolve issues

- Manage and resolve conflict
- Update staffing management plan
- Maintain issue log

Manage Stakeholders

- Communicate to satisfy needs and resolve issues with stakeholders
- Maintain issue log
- Update communications management plan

Performance Reporting

- Continually measure project performance using variance or trend analysis, earned value
- Distribute information
- Hold performance reviews
- Identify and analyze trends and variances
- Issue change requests

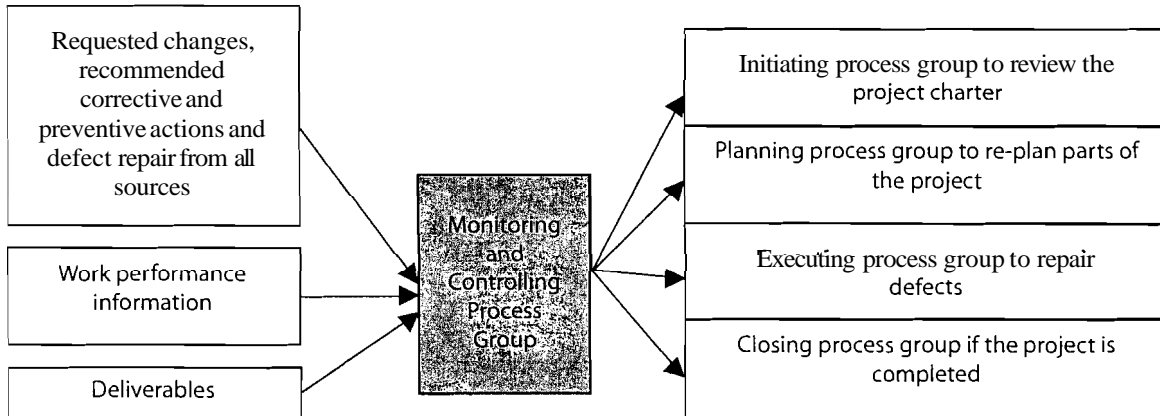
Risk Monitoring and Control

- Respond to risk triggers
- Create and implement workarounds
- Implement risk response plans
- Evaluate the effectiveness of risk response plans
- Implement corrective actions
- Work in accordance with the risk management plan
- Update lists of risks and risk response plans
- Use risk management procedures
- Issue change requests

Contract Administration

- Monitor to make sure both parties to the contract meet contractual obligations
- Protect your legal rights
- Authorize work
- Performance reporting
- Inspect and verify product
- Manage changes
- Make payments

The process of project management is not sequential. The following diagram will illustrate when you might enter the monitoring and controlling process group.



— Closing Process Group You have completed all the product scope. Is the project now done? No, work remains to be done. The closing process group is where the project is finished. This is one of the most ignored parts of the project management process. Get these important concepts down and the 14 questions about closing are generally easy.

Remember that a project is not completed when the final product scope is done, it is completed only when closure is completed. This effort will include administrative activities such as collecting and finalizing all the paperwork needed to complete the project, and technical work to verify that that product of the project is acceptable. It will also include any work needed to transfer the completed project to those who will use it and to return all resources back to the performing organization and/or the customer.

In many real-world situations, projects never seem to officially finish. Sometimes the project manager just goes on to do other things, sometimes the project just stops being worked on, sometimes the project decreases in priority. There are no official titles for the ways projects can end, because they should all be completed using the closing processes.

In any situation, ignoring project closing is a real mistake, as the work to be done during closure is extremely important to the performing organization and to the customer. The exam has many questions in this area to see if you know what the valuable activities are and when a project is really done. Try this!

Exercise Here is your last chance to score well on the exercises in this chapter. You can do it! What are the specific ACTIONS required to complete the project closing process group?

Answer If you are thinking only in PMBOK "Guide" terms, you come up with the following:

- Close project (Integration chapter)
- Contract closure (Procurement chapter)

This will not be enough to help you pass the exam. You need a more detailed understanding of what really needs to be done in the closing process (actions), and to find out if there are any of these you do not know, or have never done. Once again, read over the following list looking for gaps in your knowledge.

Action	Place ✓ Here If You Do It, Study Areas Unchecked
1. Confirm that all the requirements in the project have been met	
2. Verify and document that the project, or project phase, meets completion or exit criteria set in place during the planning process group	
3. Obtain formal (legal) sign-off of the product of the project from the customer	
4. Document the reasons for early termination	
5. Make final payments and complete cost records	
6. Gather lessons learned	
7. Update project records	
8. Ensure all the project management processes are complete	
9. Update corporate processes, procedures and templates based on lessons learned	
10. Add new skills acquired to team members' human resource records	
11. Perform procurement audits	
12. Develop closure procedure	

Action	Place ✓ Here If You Do It, Study Areas Unchecked
13. Complete contract closure and administrative closure	
14. Analyze and document the success and effectiveness of the project	
15. Create and distribute final report of project performance	
16. Index and archive project records	
17. Measure customer satisfaction	
18. Hand off the completed project deliverables to operations and maintenance	
19. Release resources	
20. Celebrate	

Did you notice something very valuable in the list above? To some people, celebration and reporting final project performance seem like unimportant parts of the project, but not the best project managers! This is why you will see them on the exam. Having some form of celebration and a final report that shows, beyond a shadow of a doubt, that you were successful and sends a strong message to all stakeholders that your team finished a project. Isn't that a good thing? Would you sign your name to the last few projects you completed? Why not? What about having a party where the entire team autographs the project?

Remember that we talked about historical records as a PMI-ism? It is during project closing that the team compiles the final version of the lessons learned and makes them available to other projects and the project management office. In addition, a concerted effort must be made to index and put all files, letters, correspondence and other records of the project into an organized archive which is stored for use on future projects.

Formal sign-off is important because it indicates the customer considers the project completed and accepts the whole project. Formal sign-off in a contracting situation constitutes legal acceptance. Without that acceptance, one cannot be sure the project was successful. Imagine that the team never gains formal acceptance, they move on to other projects. Then the customer calls for additional scope to be added to the project. How difficult would it be to regroup the team to perform the new work? Gaining formal acceptance helps ensure this is not necessary.

In addition to obtaining formal acceptance, another important part of project closing is measuring customer satisfaction. Have you ever had a customer accept your work although they were not happy with the project? This is such a common occurrence that smart project managers will also measure the customer's satisfaction level during project closing.

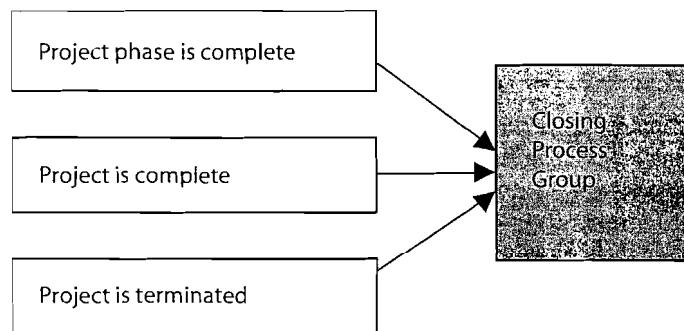
Just like lessons learned, measuring customer satisfaction should be ongoing throughout the project, but MUST occur during all parts of project closing.

What about handing off the completed project deliverables to operations and maintenance? Did you realize there is work to be done as part of the project to complete such a transfer? The work could include meetings to explain the project nuances, training and other activities as needed by the project.

Confirming that all the requirements have been met also seems unimportant to many project managers. Most studies show that many requirements are not met on projects, especially on projects with numerous pages of requirements.

Once administrative closure is completed and formal sign-off that the products of the project are acceptable is received from the customer, other stakeholders and/or the sponsor, the project is closed.

Release resources is not just releasing team members. Make sure you realize that resources are used to close a project or project phase. To complete the closing process group, all human resources are released back to their functional areas and other resources (computers, supplies, etc.) are transferred to appropriate departments.



— Inputs and Outputs Why worry about inputs and outputs? Here is yet another trick to help you gain confidence in your understanding of the project management processes.

An input means:

- "What do I need before I can ..."

An output means:

- "What will I have when I am done with..."
- Or, "What am I trying to achieve when I am doing..."

These are logical. If you really know project management, they should not require memorization. What is an input to a WBS? If you cannot answer right now, you need more basic training before training for the exam.

Do not expect all the inputs tested on the exam to be clearly listed in the *PMBOK* Guide. For example, you know that you need a team (or at least an initial team) to create a work breakdown structure, yet acquire team is not specifically listed as an input to create the work breakdown structure. You should rely on this book to understand inputs and outputs, but also be able to see the logic behind the inputs and outputs in the *PMBOK* Guide.



Exercise The following are the most important project management processes for which you should know the inputs and outputs. Make sure you add in this exercise

real-world inputs and outputs that are not in the *PMBOK® Guide*. When you are finished, check your answers with *PMBOK® Guide* and the rest of this book.

Project Management Process	Key Inputs	Key Outputs
Activity Definition		
Activity Sequencing		
Administrative Closure		
Plan Purchases and Acquisitions		
Develop Project Management Plan		
Direct and Manage Project Execution		
Activity Resource Estimating		
Schedule Development		
Scope Planning		

Project Management Process	Key Inputs	Key Outputs
Scope Definition		
Scope Verification		
Request Seller Responses		
Plan Contracting		
Select Sellers		

Exercise Here is one more TRICK to getting more familiar with the inputs and outputs. Try this exercise AFTER you have read the rest of this book. For each of the project management processes listed, fill in the rest of the columns.

Project Management Process	Knowledge Area	Process Group	What Does It Mean?	What Knowledge Area Process Comes Before?	What Knowledge Area Process Comes After?
Activity Definition					
Activity Sequencing					
Plan Purchases and Acquisitions					

Project Management Process	Knowledge Area	Process Group	What Does It Mean?	What Knowledge Area Process Comes Before?	What Knowledge Area Process Comes After?
Develop Project Management Plan					
Direct and Manage Project Execution					
Schedule Development					
Scope Definition					
Scope Planning					
Scope Verification					
Request Seller Responses					
Plan Contracting					
Select Sellers					
Develop Preliminary Project Scope Statement					
Monitor and Control Project Work					
Integrated Change Control					



Answer As you read the answers to this exercise, notice the words, "Whatever needs to be done." They repeat often and are meant to hint at all the soft, interpersonal activity needed, as well as the project management and technical activity needed. Using the phrase "whatever needs to be done" is a TRICK to understanding the full range of activity to which each topic relates.

Project Management Process	Knowledge Area	Process Group	What Does It Mean?	What Knowledge Area Process Comes Before?	What Knowledge Area Process Comes After?
Activity Definition	Time	Planning	Whatever needs to be done to create an activity list from each work package	None	Activity Sequencing
Activity Sequencing	Time	Planning	Whatever needs to be done to create a network diagram	Activity Definition	Activity Resource Estimating
Plan Purchases and Acquisitions	Procurement	Planning	Whatever needs to be done to create the contract statement of work and the procurement management plan	None	Plan Contracting
Develop Project Management Plan	Integration	Planning	Whatever needs to be done to create a project management plan that is bought into, achievable and realistic	Develop Preliminary Project Scope Statement	Direct and Manage Project Execution
Direct and Manage Project Execution	Integration	Executing	Producing work according to the project management plan	Develop Project Management Plan	Monitor and Control Project Work

Project Management Process	Knowledge Area	Process Group	What Does It Mean?	What Knowledge Area Process Comes Before?	What Knowledge Area Process Comes After?
Schedule Development	Time	Planning	Whatever needs to be done to create a bought into, achievable and realistic schedule, schedule baseline and final schedule management plan	Activity Duration Estimating	Schedule Control
Scope Definition	Scope	Planning	Whatever needs to be done to create the project scope statement	Scope Planning	Create WBS
Scope Planning	Scope	Planning	Whatever needs to be done to create a project scope management plan	None	Scope Definition
Scope Verification	Scope	Monitoring and Controlling	Inspecting project work and meeting with the customer to gain formal acceptance at the end of each project or phase	Create WBS	Scope Control
Request Seller Responses	Procurement	Executing	Whatever occurs after the procurement documents are ready and before the proposals are received	Plan Contracting	Select Sellers

Project Management Process	Knowledge Area	Process Group	What Does It Mean?	What Knowledge Area Process Comes Before?	What Knowledge Area Process Comes After?
Plan Contracting	Procurement	Planning	Whatever needs to be done after the statement of work is ready and before the procurement documents are finished	Plan Purchases and Acquisitions	Request Seller Responses
Select Sellers	Procurement	Executing	Whatever needs to be done after the proposal is received to obtain a signed contract and create a contract management plan	Request Seller Responses	Contract Administration
Develop Preliminary Project Scope Statement	Integration	Initiating	Whatever needs to be done to come up with the preliminary project scope statement for the project	Develop Project Charter	Develop Project Management Plan
Monitor and Control Project Work	Integration	Monitoring and Controlling	Whatever needs to be done to measure performance against the project management plan and recommend corrective and preventive actions, defect repair and request changes	Direct and Manage Project Execution	Integrated Change Control

Project Management Process	Knowledge Area	Process Group	What Does It Mean?	What Knowledge Area Process Comes Before?	What Knowledge Area Process Comes After?
Integrated Change Control	Integration	Monitoring and Controlling	Whatever needs to be done to evaluate the impact to all components of the "triple constraint" and approve or reject corrective and preventive actions, defect repair and changes	Monitor and Control Project Work	Close Project

Practice Exam

Project Management Processes

1. In which project management process group is the detailed project budget created?
 - A. Initiating
 - R. Before the project management process
 - C. Planning
 - D. Executing
2. The project charter is created in which project management process group?
 - A. Executing
 - B. Planning
 - C. Closing
 - D. Initiating
3. The project team has just completed the initial project schedule and budget. The NEXT thing to do is:
 - A. begin risk identification.
 - B. begin iterations.
 - C. determine communications requirements.
 - D. create a bar (Gantt) chart.
4. A detailed project schedule can be created only after creating the:
 - A. project budget.
 - B. work breakdown structure.
 - C. project management plan.
 - D. detailed risk assessment.
5. The person who should be in control of the project during project management planning is the:
 - A. project manager.
 - B. team member.
 - C. functional manager.
 - D. sponsor.
6. Which of the following is NOT an input to the initiating process group?
 - A. Company processes
 - B. The company culture
 - C. Historical WBSs
 - D. Project scope statement
7. The project sponsor has just provided the preliminary project scope statement. What is the NEXT thing to do?
 - A. Begin to complete work packages
 - B. Complete scope verification
 - C. Start integrated change control
 - D. Start to create management plans

8. The high-level project schedule constraints have just been determined. What project management process group are you in?
 - A. Initiating
 - B. Planning
 - C. Executing
 - D. Monitoring and controlling

9. The WBS and WBS dictionary are completed. The project team has begun working on identifying risks. The sponsor contacts the project manager, requesting that the responsibility assignment matrix be issued. The project has a budget of U.S. \$100,000 and is taking place in three countries using 14 human resources. There is little risk expected for the project and the project manager has managed many projects similar to this one. What is the next thing to do?
 - A. Understand the experience of the sponsor on similar projects.
 - B. Create an activity list.
 - C. Make sure the project scope is defined.
 - D. Complete risk management and issue the responsibility assignment matrix.

10. A project manager does not have much time to spend planning before the mandatory start date arrives. He therefore wants to move through planning as effectively as possible. Which of the following would you recommend?
 - A. Make sure you have a completed preliminary project scope statement and then start the WBS.
 - B. Create an activity list before creating a network diagram.
 - C. Document all the known risks before you document the high-level assumptions.
 - D. Finalize the quality management plan before you determine quality metrics.

11. The project manager is making sure that the product of the project has been completed according to the project management plan. What part of the project management process is he in?
 - A. Planning
 - B. Executing
 - C. Monitoring and controlling
 - D. Closing

12. A project manager gets a call from a team member notifying the project manager that there is a variance between the speed of a system on the project and the desired or planned speed. The project manager is surprised because that performance measurement was not identified in planning. If the project manager then evaluates whether the variance warrants a response, the project manager is in what project management process?
 - A. Initiating
 - B. Executing
 - C. Monitoring and controlling
 - D. Closing

13. A team member notifies the project manager that the activities comprising a work package are no longer appropriate. It would be BEST for the project manager to be in what part of the project management process?
- A. Corrective action
 - B. Integrated change control
 - C. Monitoring and controlling
 - D. Project closing
14. During a team meeting, a team member asks about the measurements that will be used on the project to judge performance. The team member feels that some of the measures related to activities assigned him are not valid measurements. The project is BEST considered in what part of the project management process?
- A. Closing
 - B. Monitoring and controlling
 - C. Executing
 - D. Initiating
15. During the completion of work packages, the sponsor asks the project manager to report on how the project is going. In order to prepare the report, the project manager asks all the team members what percent complete their work is. There is one team member who has been hard to manage from the beginning. In response to being asked what percent complete he is, the team member asks, "Percent complete of what?" Being tired of such comments, the project manager reports to the team member's boss that the team member is not cooperating. Which of the following is likely to be the real problem?
- A. The project manager did not get buy-in from the manager for the resources on the project.
 - B. The project manager did not create an adequate reward system for team members to improve their cooperation.
 - C. The project manager should have had a meeting with the team member's boss the first time the team member caused trouble.
 - D. The project manager does not have work packages.

Project Management Processes Answers

1. **Answer C**

Explanation Notice the use of the word "detailed." Such a budget is created during the planning process group.

2. **Answer D**

Explanation The project charter is needed before planning and execution of the work can begin.

3. **Answer C**

Explanation Iterations (choice B) cannot begin until the risks are identified, qualified, quantified and responses developed. These then create the need to revise the WBS and other parts of the project management plan. A bar chart (choice D) would have been done during the creation of the schedule, so it cannot be the next thing. Communications requirements and quality standards are needed before risks (especially risks relating to communications and quality) can be determined (choice A).

4. **Answer B**

Explanation In the project management process, the project budget (choice A), project management plan (choice C) and detailed risk assessment (choice D) come after the schedule. The only answer that could be an input is the WBS.

5. **Answer A**

Explanation The project manager should be named early in the project, during project initiating if possible.

6. **Answer D**

Explanation Notice the question asks which is NOT an input to the initiating process group. Did you read it correctly? The project scope statement (choice D) is an output of the planning process group. Did you select choice A? Companies should have processes in place for hiring resources, reporting and managing risks on projects (to name only a few). Does yours?

7. **Answer D**

Explanation The preliminary project scope statement is created during the initiating process group. Therefore the question is asking what is done next in either the initiating process group or the planning process group. For this type of question, you should look at the choice that occurs closest to the process group you are in. Choice A is done during the executing process group. Choices B and C are done during the monitoring and controlling process group. Choice D is the best choice, as it is part of the planning process group.

8. **Answer A**

Explanation High-level project constraints are determined during the initiating process group.

g. **Answer B**

Explanation Look at the order of planning the project the team has chosen. Though understanding the sponsor (choice A) might sound like a good idea, the sponsor is a stakeholder and understanding them is part of stakeholder analysis. That should have

occurred before the creation of a WBS. In planning the project, the project scope is defined (choice C is another name for finalize the project scope statement) and would come before creating a WBS. Choice D cannot be best as the team would be going in the wrong direction. Other work, like creating a network diagram, should be completed before risk can effectively be done. Only activity list (choice B) comes after the WBS and WBS dictionary.

10. **Answer B**

Explanation This question is asking which of the choices is the most effective way to move through the planning process. Choice A skips the important steps of finalizing the scope and other activities. High-level assumptions are determined during the initiating processes and all the risks are documented during the planning processes, making choice C incorrect. Metrics are part of the quality management plan, making choice D incorrect. Choice B is best, as the activity list is created immediately before the network diagram.

11. **Answer D**

Explanation Notice that this question asks about product verification, not scope verification. Scope verification is done during project monitoring and controlling, and product verification is done during project closing.

12. **Answer C**

Explanation Even though the measurement was not identified in planning, the project manager would still have to investigate the variance and determine if it is important. Therefore, the project manager is in the project monitoring and controlling process group.

13. **Answer C**

Explanation If you chose another part of the project management process, you probably forgot that the situation needs to be evaluated by the project manager before recommending a change or entering integrated change control.

14. **Answer C**

Explanation This situation does not describe an actual measurement (a monitoring and controlling activity) but rather a meeting occurring during project executing talking about control issues.

15. **Answer D**

Explanation Is this a hard question? The whole discussion of the team member and his actions is a distracter. The real problem is not that the team member is being uncooperative. He is asking a question that many team members want to ask in the real world. How can I tell you how things are going if I do not know what work I am being asked to do? The real problem is the lack of a WBS and work packages, otherwise the team member would not have to ask such a question. Choice A cannot be the answer because the project manager is not losing resources (what is implied by getting the manager's buy-in). Though a reward system (choice B) would help with cooperation, the real problem here is not cooperation. Choice C cannot be the answer because it does not solve the problem at hand (not knowing what the team member is to do). It solves another problem. If you chose C, be very careful! You can get 10 to 20 questions wrong on the exam simply because you do not see the real problem!

Quicktest

- Integration management process
- Process for making changes
- Integrated change control
- Project management plan
- Baseline
- Project charter
- Preliminary project scope statement
- Corrective action
- Enterprise environmental factors
- Organizational process assets
 - Processes
 - Corporate knowledge base
 - Historical information
 - Lessons learned
- Project manager's role as integrator
- Project statement of work
- Change control system
- Preventive action
- Defect repair
- Change control board
- Configuration management system
- Project management plan updates
- Kickoff meeting
- Work authorization system
- Change requests
- Project management information system
- Project selection methods

If you were asked, "What is the main role of the project manager?" what would you say? The answer is to perform integration. While the work of the project is being done, it is the team members' role to concentrate on completing the work packages. The project sponsor should be protecting the project from changes and loss of resources. It is the project manager's role to put all the pieces of the project together into one cohesive whole that gets the project done faster, cheaper and with fewer resources while meeting the project objectives.

The project management processes do not happen independently. A cost estimate needs to take into account risk reserves. A new resource added to the project may require changes in cost or schedule. In dealing with each situation the project manager is integrating the processes of project management.

This chapter, then, is about a key function of project managers. Integration could be said to cover the high-level work a project manager needs to do. The other knowledge areas in this book are the detailed work.

Read this chapter carefully as there is an embarrassing problem; many project managers do not know what project management is. You might find lots of things listed here that you do not know. Be careful, Integration is among the hardest areas on the exam!

Expect up to 14 questions on the exam! Many of the topics covered in this chapter relate to those in other knowledge areas. Therefore, I suggest that you read this chapter lightly the first time through the book. Return to it after reading the rest of the book and it will make more sense.

