

# Appendix B

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## *Advice for the Project Management Professional (PMP) Exam and Related Certifications*

### INTRODUCTION TO PROJECT MANAGEMENT CERTIFICATION PROGRAMS

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This appendix provides information on project management certification programs and offers some advice for earning certifications. It briefly describes various certification programs and provides detailed information on PMI's PMP and CompTIA's Project+ certifications, the structure and content of these exams, suggestions on preparing for the exams, tips for taking the exams, sample questions, information on related certifications, and advice on certification and project management in general.

### WHAT IS PMP CERTIFICATION?

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The Project Management Institute (PMI) offers certification as a Project Management Professional (PMP). As mentioned in Chapter 1, the number of people earning PMP certification grew rapidly in the past 10 years. There are PMPs in more than 120 countries throughout the world. Detailed information about PMP certification, the PMP Certification Handbook, and an online application is available from PMI's Web site ([www.pmi.org](http://www.pmi.org)) under Professional Development & Careers. The following information is quoted from PMI's Web site:

The Project Management Institute (PMI®) is the world's leading association for the project management profession. It administers a globally recognized, rigorous, education, and/or professional experience and examination-based professional credentialing program that maintains an ISO 9001 certification in Quality Management Systems. To get the latest information, please visit the breaking news section.

Earning a professional credential through PMI means that one has:

- Demonstrated the appropriate education and/or professional experience;
- Passed a rigorous examination;
- Agreed to abide by a professional code of conduct;
- Committed to maintaining their active credential through meeting continuing certification requirements.

PMI professional credentials—available to members of the Institute and nonmembers alike—are widely recognized and accepted throughout the world as evidence of a proven level of education, knowledge and experience in project management.<sup>1</sup>

Many companies and organizations are recommending or even requiring PMP certification for their project managers. A February 2003 newsletter reported that Microsoft chose PMI's PMP Certification Program as the certification of choice for its Microsoft Services Operation. Microsoft chose the PMP certification because of its global recognition and proven record in professional development for project managers.<sup>2</sup> Certcities.com ranked the PMP as No. 4 in their 10 hottest certifications for 2006. It "made a strong showing this year, rising from its debut stop at No. 10 last year, thanks in part to even stronger buzz for this industry-neutral title within the IT community."<sup>3</sup>

*Certification Magazine* published its annual review of how certification affects salaries of information technology professionals. This industry-wide study uses real-world numbers to show how education and experience affect a person's bottom-line salary. During a down market, people might ask why they should seek additional technical certifications. According to Gary Gabelhouse of *Certification Magazine*, "Perhaps it is best expressed in two words: job security. In boom times, one constantly reviews the rate of growth in salary as a key personal-success measurement. However, in down times, job security is paramount."<sup>4</sup>

The October 2004 issue of *PM Network* included an article entitled "The Rise of PMP," which provided several examples of companies and countries that have made concerted efforts to increase their number of PMPs. Hewlett-Packard had only six registered PMPs in 1997, but by August 2004, it had more than 1,500 and was adding 500 per year. Although most PMPs are in the United States (51,498) and Canada (7,444), the PMP credential is growing in popularity in

<sup>1</sup> Project Management Institute, "PMI® Certification Programs," ([www.pmi.org/info/PDC\\_CertificationsOverview.asp?nav=0401](http://www.pmi.org/info/PDC_CertificationsOverview.asp?nav=0401)) (January 2007).

<sup>2</sup> Project Management Institute Information Systems Specific Interest Group (ISSIG), *ISSIG Bits* ([www.pmi-issig.org](http://www.pmi-issig.org)) (February 2003).

<sup>3</sup> Nagel, Becky, "CertCities.com's 10 Hottest Certifications for 2006," CertCities.com, December 14, 2005.

<sup>4</sup> Global Knowledge, "2003 Certification Salary by Certmag," *Global Knowledge E-Newsletter*, Issue #56 (March 2003).

several countries, such as Japan (6,001), China (4,472), and India (2,281). Thomas Walenta, PMP, a senior project manager for IBM Germany, said, “The PMP credential lends portability to a career plan. It has significantly shaped careers in the IT industry, with global companies creating career models for project managers based on PMI certification requirements.”<sup>5</sup>

PMI also offers certifications as a Certified Associate in Project Management (CAPM), a Program Management Professional (PgMPSM), and OPM3<sup>®</sup> ProductSuite. PMI developed the CAPM certification as a stepping-stone to PMP certification. Candidates for the CAPM certification must also meet specific education and experience requirements and pass an exam. As you can imagine, the requirements are not as rigorous as they are for the PMP exam. You might want to consider getting the CAPM, or just wait until you have enough experience to earn the more popular PMP certification. PMI reported only 1,828 active CAPMs by the end of December 2006 and 221,144 active PMPs.<sup>6</sup> As described below, you need 4,500 hours of project experience or a minimum of three years if you have a bachelor’s degree to qualify for PMP certification.

## What Are the Requirements for Earning and Maintaining PMP Certification?

You can now apply to take the PMP exam online. You can also fill out the application forms and mail them in with a check, if desired. *Before* you apply to take the exam, you must meet the following four requirements:

1. Have experience working in the field of project management. When you apply to take the exam, you enter the role you played in leading and directing project tasks on one or several projects and how many hours you worked in each of the five project management process groups for each project. Roles include:
  - Project contributor
  - Supervisor
  - Manager
  - Project leader
  - Project manager
  - Educator
  - Consultant
  - Administrator
  - Other

*Note that you do not have to have experience as a project manager to take the PMP exam; any of these roles will suffice. PMP certification requires all*

<sup>5</sup> Rewi, Adrienne, “The Rise of PMP,” *PM Network* (October 2004) p. 18.

<sup>6</sup> The Project Management Institute, “PMI Today,” (February 2007).

applicants with a bachelor's degree to have a minimum of three years of unique, non-overlapping project management experience where at least 4,500 hours are spent leading and directing project tasks. Applicants without a bachelor's degree are required to have a minimum of five years of unique, non-overlapping project management experience where at least 7,500 hours were spent leading and directing project tasks. In both cases, the experience must be accrued within eight years of the date of application. You must fill out a simple form online (or by paper, if you choose not to apply online) listing the title of a project or projects you worked on; the start and end date for when you worked on the project(s); your role on the project; the number of hours you spent in leading and directing tasks related to the initiating, planning, executing, controlling, and closing processes; and a summary of the project tasks that you led and directed on the project. You must list some hours in each of the five process groups, but not for each project, if you worked on multiple projects. PMI staff will review your qualifications and let you know if you are qualified to take the PMP exam. *You cannot take the exam without this experience qualification.*

2. Document at least 35 contact hours of project management education. A contact hour is defined as one hour of participation in an educational activity. There is no time frame for this requirement. A university or college, a training company or independent consultant, a PMI chapter, a PMI Registered Education Provider (REP), a company-sponsored program, or a distance-learning company can provide the education. The hours must include content on project quality, scope, time, cost, human resources, communications, risk, procurement, and integration management. You must list the course title, institution, date, and number of hours for each course. For example, if you took a "principles of management" course at a university 20 years ago, you could list that on the education form along with a one- or two-day PMP exam preparation class.
3. Agree to the PMP certificant and candidate agreement and release statement. This form certifies that application information is accurate and complete and that candidates will conduct themselves in accordance with the Code of Ethics and Professional Conduct, professional development requirements, and other PMI certification program policies and procedures. You can simply check a box saying you agree to this information when applying online. Note that PMI randomly audits 10–15 percent of applications, so be prepared to provide more detailed information as requested if audited, such as college transcripts, signatures of supervisors or managers to verify experience, etc.

4. Pay the appropriate exam fee. As of January 2007, the PMP certification fee was \$405 for PMI members and \$555 for non-members. The re-examination fee (if you don't pass the exam) is \$275 for PMI members and \$375 for non-members. The annual individual PMI membership fee is \$129 (including the \$10 application fee). Note that students, or anyone enrolled in a degree-granting program at an accredited, or globally equivalent, college or university, can join PMI at the student member rate of only \$40 (including the \$10 application fee). If you want to earn your PMP certification, it makes sense to join PMI, not only for the financial savings, but also for other benefits. Consult PMI's Web site for membership information.

The last step in earning PMP certification is passing the exam! After PMI sends you an eligibility letter to take the PMP exam, you can sign up to take it at several different testing sites. You must take the exam within one year of receiving your eligibility letter. The eligibility letter will include complete details for scheduling your exam. As of January 2007, the PMP exam consisted of 200 four-option multiple-choice questions, and 25 of those questions are considered pretest questions that do not affect your score. The pretest questions are randomly placed throughout the exam and are used to test the validity of future examination questions. Although you cannot use any study aids during the exam, you can bring a nonprogrammable calculator to assist in performing calculations required to answer some of the questions. You are also given two blank pieces of paper, so you can write down formulas or other information when you enter the exam room, but you cannot bring in any notes or other materials. The questions on each test are randomly selected from a large test bank, so each person taking the exam receives different questions. The exam is preceded by a 15-minute computer tutorial to familiarize you with the mechanics of taking the exam. Test takers have 4 hours to take this computerized exam, and a passing score is 60.5 percent, or at least 106 correct answers out of the 175 scored questions, as of January 2007. PMI reviews and revises the exam annually. *Be sure you consult PMI's Web site for any notices about changes to the PMP exam.* For example, the passing percentage was changed several times to achieve PMI's goal of having around 75 percent of people pass the exam. PMI uses the Modified Angoff Technique, a certification industry practice standard, to determine the passing score.

PMI offers a professional development program for maintaining the PMP certification. To maintain your PMP status, you must earn at least 60 Professional Development Units within three years, pay a recertification fee every three years when you renew your certification (\$60 as of January 2007), and agree to continue to adhere to PMI's Code of Ethics and Professional Conduct. The Continuing Certification Requirements Handbook, available from PMI's Web site, provides more details on maintaining your PMP status. (Click the Professional Development & Careers link, and then select Certifications Program.)

## What Is the Structure and Content of the PMP Exam?

The PMP exam is based on information from the entire project management body of knowledge as well as the area of professional responsibility. Essentially, the exam reviews concepts and terminology in PMI's *PMBOK® Guide Third Edition*, and texts such as this one will help to reinforce your understanding of key topics in project management. Table B-1 shows the approximate breakdown of questions on the PMP exam by process group as of January 2007. Candidates should review updated exam information on PMI's Web site to make sure they are using the latest information. PMI also provides sample exam questions from their site as well. See a link to this site and other sites with free sample questions on the companion Web site.

**Table B-1: Breakdown of Questions on the PMP Exam by Process Groups**

PROCESS GROUP	PERCENT OF QUESTIONS ON PMP EXAM	NUMBER OF QUESTIONS ON PMP EXAM (OUT OF 200)
Initiating	11	22
Planning	23	46
Executing	27	54
Monitoring and Controlling	21	42
Closing	9	18
Professional Responsibility	9	18

Study Table 3-1 from Chapter 3 of this text to understand the relationships among project management process groups, activities, and knowledge areas. Table 3-1 briefly outlines which activities are performed during each of the project management process groups and what is involved in each of the knowledge areas. It is also important to understand what each of the project management activities includes. Several questions on the certification exam require an understanding of this framework for project management, and many questions require an understanding of the various tools and techniques described in the *PMBOK® Guide Third Edition* and this text.

The PMP exam includes three basic types of questions:

1. *Conceptual questions* test your understanding of key terms and concepts in project management. For example, you should know basic definitions such as what a project is, what project management is, and what key activities are included in project scope management.
2. *Application questions* test your ability to apply techniques to specific problems. For example, a question might provide information for constructing a network diagram and ask you to find the critical path or determine how

much slack is available on another path. You might be given cost and schedule information and be asked to find the schedule or cost performance index by applying earned value formulas.

3. *Evaluative questions* provide situations or scenarios for you to analyze, and your response will indicate how you would handle them. For example, a project might have many problems. A question might ask what you would do in that situation, given the information provided. Remember that all questions are multiple-choice, so you must select the best answer from the options provided.

## How Should You Prepare for the PMP Exam?

To prepare for the PMP exam, it is important to understand *your* learning and testing style, and to use whatever resources and study techniques work best for *you*. Below are some important questions to consider:

- *Are you a good test taker?* Some people are very good at studying and do well on multiple-choice exams, but others are not. If you have not taken a long multiple-choice test in a while, it may take you longer to prepare for the exam than others.
- *How confident do you need to be before taking the exam?* To pass the exam, you need to answer only 60.5 percent of the questions correctly. Your PMP certificate will not display your final score, so it does not matter if you get 61, 70, 80, 90, or even 100 percent correct.
- *How much information do you need to review before taking the exam?* The *PMBOK® Guide Third Edition* and this text should be enough content information, but many people want to review even more information before taking the PMP exam. Several companies sell books, sample tests, CD-ROMs, and audiotapes, or provide courses designed to help people pass the PMP exam. There's even a *PMP Certification for Dummies* book available with a CD-ROM of sample questions. In January 2007, performing a search using the keyword "PMP" at [www.amazon.com](http://www.amazon.com) resulted in 3,961 different books! Performing a search using the keywords "PMP exam" at [www.google.com](http://www.google.com) resulted in 547,000 hits. See the Suggested Readings section of the companion Web site for a list of suggested resources, many at no cost at all, such as [www.pmstudy.com](http://www.pmstudy.com) and [www.bestsamplequestions.com](http://www.bestsamplequestions.com).
- *How much time and money do you want to spend studying for the PMP exam?* Some people with little free time or money to spend on extra courses or materials would rather just take the PMP exam with little preparation; this will tell them what they need to study further if they don't pass on their first attempt. Even though there is a reexamination fee of \$275 (for PMI members), this cost is generally less than what you would have to pay for most exam preparation courses. Spend the time and money you

need to feel confident enough to pass the exam, but don't over-extend yourself.

- *Do you know PMI's language?* Even if you think you know about project management, studying the material in the *PMBOK® Guide Third Edition* before taking the exam will help you. Volunteer PMPs created the exam, and they often refer to information from the *PMBOK® Guide Third Edition* when writing questions. Many outstanding project managers might fail the exam if they don't use PMI's terminology or processes in their jobs.
- *Do you really understand the triple constraint of project management?* Many questions on the PMP exam are based on the scope, time, and cost knowledge areas. You should be familiar with project charters, WBSs, network diagrams, critical path analysis, cost estimates, earned value, and so on before you take the exam.
- *Do you want to meet other people in the field of project management as you study for your PMP exam?* Several chapters of PMI offer PMP exam review courses. These courses are often a good way to network with other local project managers or soon to be project managers. Many other organizations provide online and instructor-led courses in PMP preparation where you can also meet people in the field. Several organizations also provide their own in-house study groups as a means to network as well as pass the PMP exam.
- *Do you need extra support, peer pressure, or incentives to pass the PMP exam?* Having some support and positive peer pressure might help to ensure that you actually take and pass the exam in a timely manner. If you don't want to be part of a study group, even just telling a friend, colleague, or loved one that you have set a goal to pass the PMP exam by a certain date might provide motivation to actually do it. You could also reward yourself after you pass the exam.
- *How much are you willing to invest in getting PMP certification?* If you have the time and money, you could take one of the immersion courses several companies offer, like Cheetah Learning, Velociteach, Project Management Training Institute, or mScholar. These courses generally last four to five days and cost between two and three thousand dollars. The company offering the course will have you come to class with your qualification to take the PMP exam already completed, and you actually take the PMP exam on the fourth or fifth day of the class. If you don't pass, many training companies will let you take the class again at no additional cost. If you don't have any extra money to spend, you can find several free resources (see the companion Web site) and join or form your own study group, or just go take the exam and see how you do. However, try not to over study for the exam; if you know the material well and are passing practice exams, trust yourself and your skills. If you need to take it a second time to pass, just do so.

## Ten Tips for Taking the PMP Exam

1. The PMP exam is computer based and begins with a short tutorial on how to use the testing software. The software makes it easy to mark questions you want to review later, so learning how to mark questions is helpful. Using this feature can give you a feel for how well you are doing on the test. It is a good idea to go through every question somewhat quickly and mark those questions on which you want to spend more time. If you mark 79 questions or less (the total number you can miss to get 60.5 percent on all 200 questions), you should pass the exam. Remember that 25 of the questions are not scored, and you need 60.5 percent correct on the 175 scored questions.
2. The time allotted for the exam is 4 hours, and each multiple-choice question has four answer choices. You should have plenty of time to complete the exam. Use the first two to three hours to go through all of the questions. Do not spend too much time on any one question. As you work, mark each question that you would like to return to for further consideration. Then use the remaining time to check the questions you are not sure of. If you're a morning person, schedule your exam in the morning. If you work better after lunch, schedule an afternoon exam. Make sure you are alert and well rested when you go in to take the exam.
3. Some people believe it is better to change answers you were originally unsure of. If you think that a different answer is better, after reading the question again, then change your answer. Don't get hung up on any questions. Move on and focus on answering the questions you can answer correctly.
4. Do not try to read more into the questions than what is stated. There are no trick questions, but some may be poorly worded or just bad questions. Remember that they were written by volunteers and are part of a huge test bank. Most of the questions are relatively short, and there are only four options from which to choose the answer.
5. To increase your chances of getting the right answer, first eliminate obviously wrong options, and then choose among the remaining options. Take the time to read all of the options before selecting an answer. Remember you have to pick the *best* answer available.
6. Some questions require doing calculations such as earned value management. It is worthwhile to memorize the earned value formulas to make answering these questions easier. You may use a nonprogrammable calculator while taking the exam, so be sure to bring one to make performing calculations easier.

7. You should be given two pieces of blank paper to use during the exam. You might want to bring the paper yourself to make sure it is available. Before starting the test, you should write down important equations so that you do not have to rely on your memory. When you come to a question involving calculations, write the calculations down so you can check your work for errors. See Table B-2 for a summary of formulas you should know for the PMP exam.
8. Read all questions carefully. A few sections of the test require that you answer three to four questions about a scenario. These questions can be difficult; it can seem as if two of the choices could be correct, although you can choose only one. Read the directions for these types of questions several times to be sure you know exactly what you are supposed to do. Also, remember important concepts such as the importance of using a WBS, emphasizing teamwork, and practicing professional integrity. You might want to skip the longer or more difficult questions and answer the shorter or easier ones first.
9. If you do not know an answer and need to guess, be wary of choices that include words such as always, never, only, must, and completely. These extreme words usually indicate incorrect answers because there are many exceptions to rules.
10. After an hour or two, take a short break to clear your mind. You might want to bring a snack to have during your break. You might also consider bringing earplugs if you're easily distracted by noises in the room.

### Table B-2: Formulas to Know for the PMP Exam

#### TIME RELATED FORMULAS

Assume  $o = 6$ ,  $m = 21$ , and  $p = 36$  for the following examples, where  $o$  = optimistic,  $m$  = most likely, and  $p$  = pessimistic estimate

PERT weighted average =  $(o + 4m + p)/6$

Example: PERT weighted average =  $(36 + 4(21) + 6)/6 = 21$

PERT standard deviation =  $(p - o)/6$

Example: PERT standard deviation =  $(36 - 6)/6 = 5$

Range of outcomes using 1 std. dev. =  $21 - 5 = 16$  days and  $21 + 5 = 26$  days.

Range of outcomes using 2 std. dev. =  $21 - 10 = 11$  days and  $21 + 10 = 31$  days.

Range of outcomes using 3 std. dev. =  $21 - 15 = 6$  days and  $21 + 15 = 36$  days.

1 std dev. = **68.3%** of the population

2 std dev. = **95.5%** of the population

3 std dev. = **99.7%** of the population

**Table B-2: Formulas to Know for the PMP Exam (continued)****COST/EARNED VALUE FORMULAS**


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Earned Value = EV

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Actual Cost = AC

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Planned Value = PV

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Cost Variance = CV = EV – AC

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Schedule Variance = SV = EV – PV

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Cost Performance Index = CPI = EV/AC

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Schedule Performance Index = SPI = EV/PV

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BAC = Budget At Completion or the planned total budget for the project

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EAC = Estimate At Completion = BAC/CPI

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Estimated time at completion = estimated time/SPI

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Estimate To Complete (ETC) = EAC – AC

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Variance At Completion (VAC) = BAC – EAC

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Remember, a negative value for a variance or equivalently an index less than 100% means over budget/behind schedule.

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**COMMUNICATIONS FORMULAS**


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Number of communications channels =  $(n(n-1))/2$

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Example: Assume  $n = 5$ , where  $n =$  number of people

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Number of communications channels =  $(5(5-1))/2 = (5*4)/2 = 10$

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**PROCUREMENT FORMULAS**


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Point of Total Assumption (PTA) =  $(\text{Ceiling Price} - \text{Target Price})/\text{Government Share} + \text{Target Cost}$

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Make or Buy Analysis: Create a formula so the “make” option equals the “buy” or “lease” option, and then solve for the number of days.

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Example: Assume you can purchase equipment for \$3,000 and it costs \$100/day to operate OR you can lease the equipment for \$400/day. In how many days is the lease price equal to the purchase price? Set up an equation where the cost to lease or buy the item is equal to the cost to purchase or make the item.

1. Let  $d =$  the number of days you’ll use the equipment:  $400d = \$3,000 + \$100d$
2. Then solve for  $d$ . Subtract  $\$100d$  from both sides to get  $300d = \$3,000$
3. Then divide each side by  $\$300$  to get  $d = 10$

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Therefore, if you need the equipment for more than 10 days, it would be cheaper to buy it.

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## Sample PMP Exam Questions

A few sample questions similar to those you will find on the PMP exam are provided on the following pages. You can check your answers at the end of this appendix. If you miss 7 or less out of these 20 questions, you are probably ready to take the PMP exam. You can find additional sample questions and their answers on the companion Web site, as well as links to other free sample tests from various Web sites.

1. A document that formally recognizes the existence of a project is a \_\_\_\_\_.
  - a. Gantt chart
  - b. WBS
  - c. project charter
  - d. scope statement
2. Decomposition is used in developing \_\_\_\_\_.
  - a. the management plan
  - b. the communications plan
  - c. the earned value
  - d. the WBS
3. The critical path on a project represents \_\_\_\_\_.
  - a. the shortest path through a network diagram
  - b. the longest path through a network diagram
  - c. the most important tasks on a project
  - d. the highest-risk tasks on a project
4. If the earned value (EV) for a project is \$30,000, the actual cost (AC) is \$33,000, and the planned value (PV) is \$25,000, what is the cost variance?
  - a. \$3,000
  - b. -\$3,000
  - c. \$5,000
  - d. -\$5,000
5. If the earned value (EV) for a project is \$30,000, the actual cost (AC) is \$33,000, and the planned value (PV) is \$25,000, how is the project performing?
  - a. The project is over budget and ahead of schedule.
  - b. The project is over budget and behind schedule.
  - c. The project is under budget and ahead of schedule.
  - d. The project is under budget and behind schedule.
6. What is the target goal for defects per million opportunities using Six Sigma?
  - a. 1
  - b. 3.4
  - c. 34
  - d. 100
7. Project human resource management does not include which of the following processes?
  - a. acquiring the project team
  - b. developing the project team
  - c. managing the project team
  - d. estimating activity resources

8. If a project team goes from three to five people, how many more communications channels are there?
  - a. 7
  - b. 6
  - c. 5
  - d. 4
9. Your project team has identified several risks related to your project. You decide to take actions to reduce the impact of a particular risk event by reducing the probability of its occurrence. What risk response strategy are you using?
  - a. risk avoidance
  - b. risk acceptance
  - c. risk mitigation
  - d. contingency planning
10. Which type of contract provides the least amount of risk for the buyer?
  - a. firm fixed price
  - b. fixed price incentive
  - c. cost plus incentive fee
  - d. cost plus fixed fee
11. Suppose you have a project with four tasks as follows:
  - Task 1 can start immediately and has an estimated duration of 1.
  - Task 2 can start after Task 1 is completed and has an estimated duration of 4.
  - Task 3 can start after Task 2 is completed and has an estimated duration of 5.
  - Task 4 can start after Task 1 is completed and must be completed when Task 3 is completed. Its estimated duration is 8.What is the length of the critical path for this project?
  - a. 9
  - b. 10
  - c. 11
  - d. 12
12. In which of the following project management process groups are the most time and money typically spent?
  - a. initiating
  - b. planning
  - c. executing
  - d. controlling

13. Creating a probability/impact matrix is part of which risk management process?
  - a. risk management planning
  - b. risk identification
  - c. qualitative risk analysis
  - d. quantitative risk analysis
14. It is crucial that your project team finish your project on time. Your team is using a technique to account for limited resources. You have also added a project buffer before the end date and feeding buffers before each critical task. What technique are you using?
  - a. critical path analysis
  - b. PERT
  - c. critical chain scheduling
  - d. earned value management
15. One of your senior technical specialists informs you that a major design flaw exists in a systems development project you are managing. You are already testing the system and planned to roll it out to more than 5,000 users in a month. You know that changing the design now will cause several cost and schedule overruns. As project manager, what should you do first?
  - a. Issue a stop work order until you understand the extent of the flaw.
  - b. Notify your project sponsor immediately to see if there are additional funds available to work on this problem.
  - c. Notify your senior management and let them decide what to do.
  - d. Hold a meeting as soon as possible with key members of your project team to discuss possible solutions to the problem.
16. You are a member of a large government project. You know that the contract insists that all equipment be manufactured in the United States. You see a senior member of your team replacing a company etching on a piece of equipment that was made in a foreign country. You confront this person, and he says he is following the project manager's orders. What should you do?
  - a. Nothing; the project manager made the decision.
  - b. Immediately report the violation to the government.
  - c. Update your resume and look for another job.
  - d. Talk to the project manager about the situation, and then decide what to do.
17. Which of the following is not an output of the integrated change control process?
  - a. project management plan updates
  - b. approved corrective action
  - c. forecasts
  - d. deliverables

18. The ceiling price for a contract is \$1.25 million, the target price is \$1.1 million, the target cost is \$1 million, and the government share is 75%. What is the point of total assumption?
  - a. \$1.2 million
  - b. \$1 million
  - c. \$1.1 million
  - d. there is not enough information
19. Obtaining quotes, bids, offers, or proposals is part of which project procurement management process?
  - a. plan purchases and acquisitions
  - b. request seller responses
  - c. select sellers
  - d. contract administration
20. Your boss believes that all of your project team members avoid work as much as possible. He or she often uses threats and various control schemes to make sure people are doing their jobs. Which approach to managing people does your boss follow?
  - a. Maslow's hierarchy of needs
  - b. Theory X
  - c. Theory Y
  - d. Herzberg's motivation and hygiene factors

## WHAT IS PROJECT+ CERTIFICATION?

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The Computing Technology Industry Association (CompTIA) is the world's largest developer of vendor-neutral IT certification exams. By January 2007, more than 900,000 people worldwide have earned CompTIA certifications in topics such as PC service, networking, security, and Radio Frequency Identification (RFID). In April 2001, CompTIA started offering its IT Project+ certification, which was purchased from Prometric-Thomson Learning, and recognized as the Gartner Institute Certification Program. The certification was renamed Project+ in August 2004. According to CompTIA's manager of public relations, there are more than 9,000 people with CompTIA's Project+ certification as of January 2007. Detailed information about Project+ certification is

available from CompTIA's Web site ([www.comptia.org](http://www.comptia.org)) under certification. The following information is quoted from a press release on their site

Individuals managing any type of project for their company—whether or not it has an IT component to it—can benefit enormously from using the certification as a means of validating project management competency," said Lisa-Ann Barnes, president, IreeTec, Inc. and chair of the CompTIA Project+ advisory committee.

Individuals passing the certification exam validate knowledge mastery equivalent to 2,000 hours of on-the-job practical experience. CompTIA Project+ can serve as a standalone certificate for individuals or as a stepping-stone toward the Project Management Institute PMP certification, which requires 4,500 hours of experience.<sup>7</sup>

## What Are the Requirements for Earning and Maintaining Project+ Certification?

You can register to take the Project+ exam online from CompTIA's Web site. Testing sites include Thomson Prometric and Pearson VUE. Unlike the PMP exam, there are very few requirements you need to meet to take the Project+ exam. CompTIA does not require that you have any work experience or formal education in project management before you can take the Project+ exam, but they do recommend 2,000 hours of work experience. The main requirements include paying a fee and passing the exam. Important information is summarized below:

1. As of January 2007, the cost for taking the Project+ exam is \$225 for non-members in the United States.
2. To pass this 90-minute, 80-question exam, you must score at least 63 percent.
3. You do not need to renew your Project+ certification.
4. Project+ certification is one of the prerequisites or equivalents to Novell's Certified Novell Engineer (CNE), Certified Novell Administrator (CNA), and Certified Novell Instructor (CNI) certifications. CompTIA's Project+ certification is also a Continuing Certification Requirement (CCR) to maintaining a Master CNE certification.
5. You can earn college credit with the Project+ certification. For example, CompTIA's Web site says that Capella University will provide six credit hours to someone with the Project+ certification. Many colleges and universities will grant credit based on your experience or other certifications. There is usually some fee involved, but it's often much less than the cost of taking the courses.

<sup>7</sup> CompTIA Web site ([www.comptia.org/pressroom/get\\_pr.aspx?prid=489](http://www.comptia.org/pressroom/get_pr.aspx?prid=489)) (October 2004).

## Additional Information on the Project+ Exam

Because there are no experience or education requirements for taking the Project+ exam, you might want to take it very early in your career. Once you have enough experience and education to take the PMP exam, you might want to earn and maintain PMP certification.

As stated above, the Project+ exam consists of 80 questions. Table B-3 shows the approximate breakdown of questions on the Project+ exam by four domain areas. Candidates should review updated exam information on CompTIA's Web site to make sure they are prepared for the exams. For example, CompTIA provides a detailed list of objectives you should understand before taking the Project+ exam. Studying information in this book will also help you prepare for the Project+ exam. You might also want to purchase an exam guide to get specific information and access to more sample questions.

**Table B-3: Breakdown of Questions on the Project+ Exam by Domain Areas**

DOMAIN AREA	PERCENT OF QUESTIONS ON PROJECT+ EXAM
Project Initiation and Scope Definition	20
Project Planning	30
Project Execution, Control, and Coordination	43
Project Closure, Acceptance, and Support	7

Much of the advice for taking the PMP exam also applies to taking the Project+ exam. Many people find the questions to be similar on both exams, although the PMP exam is longer and more comprehensive. Below are some of the main differences between the content and types of questions you will find on the Project+ exam:

- The Project+ exam includes some scenarios and content specific to the information technology industry. For example, you should understand the various systems development life cycles and issues that often occur on information technology projects.
- You should understand the various roles of people on information technology projects, such as business analysts, database analysts, programmers, and so on.
- Although many of the questions are multiple-choice like the PMP exam questions, several questions involve choosing two or more correct answers. Several questions also involve matching or putting items in order, called drag-and-drop questions.
- The Project+ exam is not based on the *PMBOK® Guide Third Edition*, so you do not need to know the processes involved in the various knowledge areas. However, much of the terminology, concepts, tools, and techniques are the same on both exams.

## Sample Project+ Exam Questions

A few sample questions similar to those you will find on the Project+ exam are provided below. CompTIA also provides sample questions on their Web site at [http://certification.comptia.org/resources/practice\\_test.aspx](http://certification.comptia.org/resources/practice_test.aspx). You can check your answers at the end of this appendix.

1. Two software developers on your project disagree on how to design an important part of a system. There are several technologies and methodologies they could use. What should be the primary driver in deciding how to proceed?
  - a. following corporate standards
  - b. following industry standards
  - c. meeting business needs
  - d. using the lowest-cost approach
2. Match the following items to their descriptions:

Stakeholder	a. Acts as a liaison between the business area and developers
Project manager	b. Writes software code
Business analyst	c. Person involved in or affected by project activities
Programmer	d. Responsible for managing project activities
3. For a project to be successful, the project manager should strive to understand and meet certain goals. What are the three main project goals to meet? Select three answers.
  - a. scope or performance goals
  - b. time goals
  - c. political goals
  - d. cost goals
  - e. stock price goals
4. You have received an incomplete project scope definition. Put the following actions in order of how you should proceed to complete them.
  - a. Incorporate additional changes to the scope definition document.
  - b. Review the draft scope definition document with your project team.
  - c. Get signatures on the completed scope definition document.
  - d. Rewrite the draft scope definition document with your users and project team.
5. What term is used to describe the process of reaching agreement on a collective decision?
  - a. collaboration
  - b. cooperation
  - c. coordination
  - d. consensus

6. What is a variance?
  - a. a buffer in a duration estimate
  - b. a small amount of money set aside for contingencies
  - c. a form of risk management
  - d. a deviation from the project plan
7. Which of the following would be legitimate reasons for a vendor to request a delay in delivering a product? Select two answers.
  - a. The vendor may have underestimated the amount of time required to produce and deliver the product.
  - b. The project contact from the vendor's organization may be going on vacation.
  - c. The vendor might be able to provide a better product by delivering the product late.
  - d. The vendor might lose money by delivering the product late.
8. When should you involve stakeholders in the change control process on information technology projects?
  - a. before a change is submitted
  - b. after a change is submitted
  - c. when a change is submitted
  - d. throughout the life of a project
9. Which of the following techniques can be used to help manage requirements? Select three answers.
  - a. prototyping
  - b. use case modeling
  - c. JAD
  - d. worst case modeling
10. Match the following items to their descriptions:

Lessons learned	a. Leave a clear and complete history of a project
Project audits	b. Review project progress and results
Project archives	c. Document what went right or wrong on a project

## WHAT OTHER EXAMS OR CERTIFICATIONS RELATED TO PROJECT MANAGEMENT ARE AVAILABLE?

In recent years, several organizations have been developing more certifications related to project management and information technology project management, in particular. Some involve taking exams while others require coursework or attendance at workshops. Below are brief descriptions of other existing exams or certifications related to project management:

- Microsoft provides certification as a Microsoft Office Specialist (MOS) to recognize proficiency in using its software products. As of January 2007, you can earn certification for Microsoft Project 2000 or 2002. In October 2006, Microsoft Learning launched a new Microsoft Office Project 2007 Certification program. Its purpose is “to help advance project management as a profession and maximize value for its customer base of nearly 20 million Microsoft Office Project user licenses.”<sup>8</sup> Microsoft is using the PMI’s *PMBOK® Guide Third Edition* as a foundation for supporting specific Project 2007 competencies. See Microsoft’s Web site for more details.
- The International Project Management Association (IPMA) offers a four-level certification program. The main requirements for each level are derived from typical activities, responsibilities, and requirements from practice. The IPMA four-level certification system, in descending order, includes the Certified Project Director, Certified Senior Project Manager, Certified Project Manager, and Certified Project Management Associate. More than 50,000 people worldwide had earned IPMA certifications, according to IPMA’s Web site in January 2007. See [www.ipma.ch](http://www.ipma.ch) for more details.
- Certified IT Project Manager (CITPM): In 1998, the Singapore Computer Society collaborated with the Infocomm Development Authority of Singapore to establish an Information Technology Project Management Certification Program. PMI signed a Memorandum of Understanding with the Singapore Computer Society to support and advance the global credentialing of project management and information technology expertise. In January 2007, the Singapore Computer Society’s Web site listed three levels of the CITPM Certification: CITPM (Senior), CITPM, and CITPM (Associate). For more details consult their Web site ([www.scs.org.sg/about\\_certprog.php](http://www.scs.org.sg/about_certprog.php)).

<sup>8</sup> Microsoft, “Microsoft Advances Its Project Management Technology and the Project Management Profession,” Microsoft PressPass, October 20, 2006.

- PMI's additional certifications. As mentioned earlier, PMI also offers certification as a Certified Associate in Project Management (CAPM), a Program Management Professional (PgMPSM), and OPM3® ProductSuite. Consult PMI's Web site for updated information on their certification programs.
- Many colleges, universities, and corporate training companies now provide their own certificate programs or entire degrees in project management. Typing "project management certificate" into google.com in January 2007 resulted in 81,400 hits. Some of the certificate courses apply toward bachelor's or advanced degrees, while many do not. Like any other educational program, it is important to research the quality of the program and find one that will meet your specific needs. See the author's Web site for a summary of more than 120 U.S. graduate programs created as part of a class project in 2006 ([www.kathyschwalbe.com](http://www.kathyschwalbe.com), under Project Management Info). Also see sites like [www.gradschools.com](http://www.gradschools.com) to find more information on graduate programs in project management throughout the world.

## FINAL ADVICE ON CERTIFICATION AND PROJECT MANAGEMENT IN GENERAL

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Now that you have read this text and discussed project management with others, I hope that you have grown to see project management as a valuable skill, especially in the information technology field. Project management certification can be your first step toward advancing your career in the fast-paced world of technology and business, for no matter how much things change, the need for projects and project managers is a constant.

The knowledge and experience I have gained working on and managing projects continues to help me in my career and my personal life. I was fortunate to step into a project management role very early in my career as an Air Force officer. My first real job at the age of 22 was as a project manager. I have held several job titles since then—systems analyst, senior engineer, technical specialist, information technology management consultant, independent consultant, college professor, and now author. All of these jobs included working on or managing projects. As a wife and mother of three, I can also attest to the fact that project management skills help in planning and executing social activities (weddings, birthday parties, fundraisers, and so on) and in dealing with the joys and challenges of everyday life.

### DISCUSSION QUESTIONS

1. What is PMP certification, and why do you think the number of people earning it has grown so much in the past ten years?
2. What do you need to do before you can take the PMP exam? What is the exam itself like? What do you need to do to maintain PMP certification?

What do you need to do to take the Project+ exam? How does the Project+ exam differ from the PMP exam? Do you need to renew Project+ certification?

3. What is the difference between conceptual, application, and evaluative questions? Which project management process groups have the most questions on the PMP exam? What are the four domain areas tested on the Project+ exam?
4. Which tips for taking the PMP exam do you think would be most helpful for you?
5. If you plan to take the Project+ or PMP exam soon, what should you do to prepare?
6. Briefly describe project management certification programs other than the PMP or Project+ certifications.

## EXERCISES

1. Go to PMI's Web site and review the information about taking the PMP exam. Write a two-page paper summarizing what you found.
2. Go to CompTIA's Web site and review the information about taking the Project+ exam. Write a two-page paper summarizing what you found.
3. Answer the 20 sample PMP questions in this text or take another sample test (see the additional PMP questions on the companion Web site or links to other sample questions, or do an Internet search to find some other sample PMP tests). Take the sample test, and then score your results. Summarize how you did and areas you would need to study before you could take the PMP exam.
4. Interview someone who has PMP or Project+ certification. Ask him or her why he or she earned the certification and how it has affected his or her career. Write your findings in a two-page paper.
5. Do an Internet search on earning PMP or Project+ certification. Be sure to search for Yahoo! groups or similar sites related to these topics. What are some of the options you found to help people prepare for either exam? If you were to take one of the exams, what do you think you would do to help study for it? Do you think you would need additional information beyond what is in this text to help you pass? Write a two-page paper describing your findings and opinions.
6. Read a recent issue of PMI's *PM Network* magazine. You can order a copy from PMI's Web site, or contact someone from a local PMI chapter to obtain a copy. Summarize all of the ads you find in the magazine related to earning PMP or other project management related certification in a two-page paper. Also, include your opinion on which ad, course, book, CD-ROM, or other media appeals to you the most.

## **ANSWERS TO SAMPLE PMP EXAM QUESTIONS**

1. c
2. d
3. b
4. b
5. a
6. b
7. d
8. a
9. c
10. a
11. b
12. c
13. c
14. c
15. d
16. d
17. c
18. a
19. b
20. b

## **ANSWERS TO SAMPLE PROJECT+ EXAM QUESTIONS**

1. c
2. c, d, a, b
3. a, b, d
4. b, d, a, c
5. d
6. d
7. a, c
8. d
9. a, b, c
10. c, b, a