**150 MCQs (Integration)**

**1. You work for a software development company that has followed the waterfall development model for more than 20 years. Lately, a number of customers have com­plained that your company is taking too long to complete its projects. You attended a class on agile development methods and believe that if the company used the agile approach, it could provide products to clients in a shorter time period. However, it would be a major culture change to switch from the waterfall methodology to the agile approach and to train staff members in this new approach. You mentioned this idea to the director of the PMO, and although she liked the idea, she would need approval from the company’s portfolio review board to move forward with it. She suggested that you document this idea in a—**

a. Business need

b. Product scope description

c. Project charter

d. Business case

**2. You are managing a large project with 20 key internal stakeholders, eight contractors, and six team leaders. You must devote attention to effective integrated change control. This means you are concerned primarily with—**

a. Reviewing, approving, and controlling changes

b. Maintaining baseline integrity, integrating product and project scope, and coordinating change across knowl­edge areas

c. Integrating deliverables from different functional specialties on the project

d. Establishing a change control board that oversees the overall project changes

**3. You plan to hold a series of meeting as you execute the project plan. While different attendees will attend each meeting, a best practice to follow is to:**

a. Group stakeholders into categories to determine which ones should attend each meeting

b. Not mix the types of meetings on your project

c. Be sensitive to the fact that stakeholders often have very different objectives and invite them to determine the meeting’s agenda

d. Recognize that roles and responsibilities may overlap so focus on holding meetings primarily for decision making

**4. You are the project manager in charge of developing a new shipping container for Globus Ocean Transport, which needs to withstand winds of 90 knots and swells of 30 meters. In determining the dimension of the con­tainer and the materials to be used in its fabrication, you convene a group of knowledgeable professionals to gather initial requirements, which will be included in the—**

a. Project charter

b. Bill of materials

c. WBS

d. Project Statement of Work

**5. You have assembled a core team to develop the project management plan for the next generation of fatigue fight­ing drugs. The science is complex, and the extended team of researchers, clinicians, and patients for trials exceeds 500 people. The content of your project management plan will be directed primarily by two factors. They are—**

a. Project complexity and the capability of resources

b. Number of resources and project schedule

c. Team member experience and budget

d. Application area and complexity

**6. When you established the change control board for your avionics project, you established specific procedures to govern its operation. The procedures require all approved changes to baselines to be reflected in the—**

a. Performance measurement baseline

b. Change management plan

c. Quality assurance plan

d. Project management plan

**7. You are beginning a new project staffed with a virtual team located across five countries. To help avoid conflict in work priorities among your team members and their functional managers, you ask the project sponsor to prepare a—**

a. Memo to team members informing them that they work for you now

b. Project charter

c. Memo to the functional managers informing them that you have authority to direct their employees

d. Human resource management plan

**8. The purpose of economic value added (EVA) is to—**

a. Determine the opportunity costs associated with the project

b. Determine a non–time-dependent measure of profit or return

c. Assess the net operating profit after taxes

d. Evaluate the return on capital percent versus the cost of capital percent

**9. Facilitation techniques are used throughout project man­agement. Your company is embarking on a project to completely eliminate defects in its products. You are the project manager for this project, and you are developing your project charter. To assist you, which of the following facilitation techniques did you use?**

a. Surveys

b. Delphi approach

c. Meeting management

d. Focus groups

**10. The direct and manage project work process truly is important in project management. It affects many other key processes and uses inputs from others. Working with your team at its kickoff meeting, you explain the key benefit of this process is to—**

a. Implement approved changes

b. Provide overall management of the project work

c. Lead and perform activities in the project manage­ment plan

d. Perform activities to accomplish project objectives

**11. You are managing a project in an organization is characterized by with rigid rules and policies and strict supervisory controls. Your project, sponsored by your CEO who is new to the company, is to make the orga­nization less bureaucratic and more participative. You are developing your project management plan. Given the organization as it now is set up, as you prepare your plan, you can use which of the following organizational process assets—**

a. Guidelines and criteria

b. Project management body of knowledge for your industry

c. Organizational structure and culture

d. The existing infrastructure

**12. You are fairly new to managing a project but have been a team member for many years. You are pleased you were selected to manage your company’s 2015 model line of hybrid vehicles. You are now planning your project and have been preparing the subsidiary plans as well. You realize some project documents also are required to help manage your project. An example of one that you believe will be especial helpful is the—**

a. Business case

b. Key performance indicators

c. Project management information system

d. Project statement of work

**13. You work for a telecommunications company, and when developing a project management plan for a new project, you found that you must tailor some company processes because the product is so different than those products typically produced by your company. To tailor these processes, you will follow—**

a. Standardized guidelines and work instructions

b. Stakeholder risk tolerances

c. Expert judgment

d. Structure of your company

**14. You are implementing a project management methodol­ogy for your company that requires you to establish a change control board. Which one of the following state­ments best describes a change control board?**

a. Recommended for use on all (large and small) projects

b. Used to review, evaluate, approve, delay, or reject changes to the project

c. Managed by the project manager, who also serves as its secretary

d. Composed of key project team members

**15. An automated tool, project records, performance indicators, data bases, and financials are examples of items in—**

a. Organizational process assets

b. Project management information systems

c. Project management planning approaches

d. The tools and techniques for project plan development

**16. You realize that projects represent change, and on your projects, you always seem to have a number of change requests to consider. In your current project to manage the safety of the nation’s cheese products and the testing methods used, you decided to prepare a formal change management plan. An often overlooked type of change request is—**

a. Adding new subject matter experts to your team

b. Updates

c. Work performance information

d. Enhancing the reviews performed by your project’s governance board

**17. You have been directed to establish a change control system for your company, but must convince your colleagues to use it. To be effective, the change control system must include—**

a. Procedures that define how project documents may be changed

b. Specific change requests expected on the project and plans to respond to each one

c. Performance reports that forecast project changes

d. A description of the functional and physical characteristics of an item or system

**18. You are working on the next generation of software for mobile phones for your telecommunications company. While time to market is critical, you know from your work on other projects that management reviews can be helpful and plan to use them on your project. You are documenting them as part of your—**

a. Governance plan

b. Change management plan

c. Performance reviews

d. Project management plan

**19. Your cost control specialist has developed a budget plan for your project to add a second surgical center to the Children’s Hospital. As you analyze cash flow require­ments, you notice that cash flow activity is greatest in the closing phase. You find this unusual because on most projects the largest portion of the budget spent during—**

a. Initiating

b. Monitoring and Controlling

c. Controlling

d. Executing

**20. You are project manager for a systems integration effort and need to procure the hardware components from external sources. Your subcontracts administrator has told you to prepare a product description, which is referenced in a—**

a. Project statement of work

b. Contract scope statement

c. Request for proposal

d. Contract

**21. Because your project is slated to last five years, you believe rolling wave planning is appropriate. It provides information about the work to be done—**

a. Throughout all project phases

b. For successful completion of the current project phase

c. For successful completion of the current and subsequent project phases

d. In the next project phase

**22. You want to minimize the impact of changes on your project, yet you want to ensure that change is managed when and if it occurs. This can be done through each of the following ways EXCEPT—**

a. Rejecting requested changes

b. Approving changes and incorporating them into a revised baseline

c. Documenting the complete impact of requested changes

d. Ensuring that project scope changes are reflected in changes to product scope

**23. You are managing a project to introduce a new product to the marketplace that is expected to have a very long life. In this situation, the concept of being temporary, which is part of the definition of a project,—**

a. Does not apply because the project will have a lasting result

b. Does not apply to the product to be created

c. Recognizes that the project team will outlive the actual project

d. Does not apply because the project will not be short in duration

**24. When closing a project, it is a best practice to—**

a. Update the project documents

b. Prepare a sustainment plan for the project’s benefits

c. Measure product scope against the project manage­ment plan

d. Review the scope baseline

**25. All the following are project baselines that are generally part of the project management plan EXCEPT—**

a. Technical

b. Scope

c. Time

d. Cost

**Answer Key**

1. d. Business case

The business case is used to provide the necessary information to determine whether or not a project is worth its investment. It is used to justify the project and typically contains a cost-benefit analysis and a business need. [Initiating]

PMI®, PMBOK® Guide, 2013, 69

2. a. Reviewing, approving, and controlling changes

Performing integrated change control consists of coordinating and managing changes across the project. Activities that occur within the context of perform integrated change control include: validate scope, control scope, control schedule, control costs, perform quality assurance, control quality, manage the project team, control communications, control risks, conduct procurements, control procurements, manage stakeholder engagement, and control stake­holder engagement. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 94–95

3. b. Not mix the types of meetings on your project

Meetings are a tool and technique used in direct and manage project work. Meetings tend to be one of three types: information exchange; brainstorming, option evaluation, or design; or decision making. A best practice is to not combine the types of meetings and prepare for them with a well-defined agenda, purpose, objective, and time frame. They should be documented using minutes and action items. [Executing]

 PMI®, PMBOK® Guide, 2013, 84

4. a. Project charter

The project charter documents the business needs, assumptions, constraints, understanding of the cus­tomer needs and high-level requirements and what the new product, service, or result is to satisfy. It is the document used to formally authorize the project. [Initiating]

PMI®, PMBOK® Guide, 2013, 71

5. d. Application area and complexity

The content of the project management plan is pri­marily influenced by the application area [in this case drug development] and complexity of the project. The size of the plan is typically commensurate with the size and complexity of the project. [Planning]

PMI®, PMBOK® Guide, 2013, 74

6. d. Project management plan

The project management plan must be updated changes to subsidary plans and baselines subject to formal change control processes. Those changes must be communicated to appropriate stakeholders in a timely manner. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 100

7. b. Project charter

Although the project charter cannot stop con­flicts from arising, it can provide a framework to help resolve them, because it describes the project manager’s authority to apply organizational resources to project activities. [Initiating]

 Meredith and Mantel 2012, 228; PMI®, PMBOK® Guide, 2013, 71–72

8. d. Evaluate the return on capital percent versus the cost of capital percent

EVA quantifies the value a company provides to its investors and seeks to determine if a company is creating or destroying value to its shareholders. It is calculated by subtracting the expected return, (represented by the capital charge), from the actual return that a company generates, (represented by net operating profit after taxes). [Initiating]

Cohen and Graham 2001, 217

9. c. Meeting management

Meeting management is an example of a facilitation technique used in developing the project charter as meetings may be held with key stakeholders and sub­ject matter experts. Other facilitation techniques used to guide preparation of the charter are brainstorming, problem solving, and conflict resolution. [Initiating]

PMI®, PMBOK® Guide, 2013, 71

10. b. Provide overall management of the project work

While all of the answers apply to the direct and manage project work process, the key benefit is that it involves providing overall management of the work of the project, encompassing the other answers listed. [Executing]

 PMI®, PMBOK® Guide, 2013, 79

11. b. Guidelines and criteria

While you are managing a different type of project, the organization has managed projects before and therefore may have as part of its organizational process assets a project management template, which sets forth guidelines and criteria to tailor the organization’s processes to satisfy specific needs of the project. [Planning]

PMI®, PMBOK® Guide, 2013, 75

12. d. Project statement of work

The project statement of work is a useful document as it describes the products, services, or results the project is to deliver. It references the business need, product scope description, and the strategic plan. [Initiating and Planning]

PMI®, PMBOK® Guide, 2013, 68, 78

13. a. Standardized guidelines and work instructions

Standardized guidelines and work instructions are an organizational process asset to consider as the project management plan is developed. They include guidelines and criteria to tailor the organization’s set of standard processes to satisfy the specific needs of the project. [Planning]

 PMI®, PMBOK® Guide, 2013, 75

14. b. Used to review, evaluate, approve, delay, or reject changes to the project

The change control board’s powers and responsi­bilities should be well defined and agreed upon by key stakeholders. On some projects, multiple change control boards may exist with different areas of responsibility. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 96

15. b. Project management information systems

The items listed are part of these systems, a tool and technique in both processes. [Executing and Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 84, 92

16. b Updates

Change requests may include corrective actions, pre­ventive actions, defect repairs, or updates. Updates are changes to formally controlled project documents or plans to reflect modified or additional content. [Executing]

 PMI®, PMBOK® Guide, 2013, 85

17. a. Procedures that define how project documents may be changed

A change control system is a collection of formal, documented procedures that define the process used to control change and approve or reject changes to project documents, deliverables, or baselines. It includes the paperwork, tracking systems, and approval levels necessary to authorize changes. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 96

18. d. Project management plan

The project management plan describes how the project will be executed and monitored and con­trolled. While it contains a number of subsidiary plans, it also contains other items including infor­mation on key management reviews for contents, their extent, and timing to address open issues and pending decisions. [Planning]

PMI®, PMBOK® Guide, 2013, 77

19. d. Executing

Executing is where the majority of the budget is spent because this is the process where all of the resources (people, material, etc.) are applied to the activities and tasks in the project management plan. [Executing]

 PMI®, PMBOK® Guide, 2013, 56

20. a. Project statement of work

The project statement of work describes in a narra­tive form the products, services, or results that the project will deliver. It references the product scope description as well as the business needs and the strategic plan. [Initiating]

PMI®, PMBOK® Guide, 2013, 68

21. c. For successful completion of the current and subse­quent project phases

Rolling wave planning provides progressive detailing of the work to be accomplished throughout the life of the project, indicating that planning and documen­tation are iterative and ongoing processes. [Planning]

PMI®, PMBOK® Guide, 2013, 45 and 560

22. d. Ensuring that project scope changes are reflected in changes to product scope

Integrated change control requires maintaining the integrity of baselines by releasing only approved changes into project products, services, or results. It also ensures that changes to product scope are reflected in the project scope definition. This is done by coordinating changes across the entire project. [Monitoring and Controlling]

 PMI®, PMBOK® Guide, 2013, 94 and 99–100

23. b. Does not apply to the product to be created

A project is completed when its objectives have been achieved or when they are recognized as being unachievable and the project is terminated. In this case, the end will occur when the productis finished. Thus, the concept of temporary applies to the project life cycle—not the product life cycle. [Planning]

PMI®, PMBOK® Guide, 2013, 3–4

24. d. Review the scope baseline

In closing the project, it is necessary to ensure that the project work is completed, and the project has met its objectives. Since project scope is measured against the project management plan, the project manager then reviews the scope baseline to ensure completion. [Closing]

PMI®, PMBOK® Guide, 2013, 101

25. a. Technical

Scope, time, and cost are examples of project baselines to be part of the project management plan.

 PMI®, PMBOK® Guide, 2013, 76

**SCOPE**

**1. Progressive elaboration of product characteristics on your project must be coordinated carefully with the—**

a. Proper project scope definition

b. Project stakeholders

c. Scope change control system

d. Customer’s strategic plan

**2. You are examining multiple scope change requests on a project you were asked to take over because the previous project manager decided to resign. To assess the degree to which the project scope will change, you need to compare the requests to which project document?**

a. Preliminary scope statement

b. WBS

c. Change management plan

d. Scope management plan

**3. You and your project team recognize the importance of project scope management to a project’s overall success; therefore, you include only the work required for success­ful completion of the project. The first step in the Project Scope Management process is to—**

a. Clearly distinguish between project scope and product scope

b. Prepare a scope management plan

c. Define and document your stakeholders’ needs to meet the project’s objectives

d. Capture and manage both project and product requirements

**4. An example of an organizational process asset that could affect how project scope is to be managed is—**

a. Personnel administration

b. Marketplace conditions

c. Historical information

d. Organizational culture

**5. You are managing a complex project for a new method of heating and air conditioning in vehicles. You will use both solar and wind technologies in this project to reduce energy costs. Therefore, you must ensure that the work of your project will result in delivering the project’s specified scope, which means that you should measure completion of the product scope against the—**

a. Scope management plan

b. Project management plan

c. Product requirements

d. Requirements management plan

**6. A key tool and technique used in define scope is—**

a. Templates, forms, and standards

b. Decomposition

c. Expert judgment

d. Project management methodology

**7. Alternatives generation often is useful in defining project scope. An example of a technique that can be used is—**

a. Sensitivity analysis

b. Decision trees

c. Mathematical model

d. Lateral thinking

**8. Product analysis techniques include all the following EXCEPT—**

a. Value engineering

b. Value analysis

c. Systems analysis

d. Bill of materials

**9. The baseline for evaluating whether requests for changes or additional work are contained within or outside the project’s exclusion is provided by the—**

a. Project management plan

b. Project scope statement

c. Project scope management plan

d. WBS dictionary

**10. Rather than use a WBS, your team developed a bill of materials to define the project’s work components. A customer review of this document uncovered that a scope change was needed, because a deliverable had not been defined, and a change request was written subsequently. This is an example of a change request that was the result of—**

a. An external event

b. An error or omission in defining the scope of the product

c. A value-adding change

d. An error or omission in defining the scope of the project

**11. Collecting requirements is critical in project scope man­agement as it becomes the foundation for the project’s—**

a. Scope management plan

b. WBS

c. Schedule

d. Scope change control system

**12. The project scope statement addresses and documents all the following items EXCEPT—**

a. Project exclusions

b. The relationship between the deliverables and the business need

c. Product scope description

d. Project management methodology (PMM)

**13. The first step in collecting requirements on any project, large or small, is to—**

a. Talk with the project stakeholders through interviews

b. Review the scope management plan

c. Conduct facilitated workshops with stakeholders

d. Prepare a requirements document template that you and your team can use throughout the collect require­ments process

**14. You want to structure your project so that each project team member has a discrete work package to perform. The work package is a—**

a. Deliverable at the lowest level of the WBS

b. Task with a unique identifier

c. Required level of reporting

d. Task that can be assigned to more than one organiza­tional unit

**15. Quality function deployment is one approach for collect­ing requirements. Assume that you have studied the work of numerous quality experts, such as Deming, Juran, and Crosby, and your organization has a policy that states the importance of quality as the key constraint of all project constraints. You and your team have decided to use quality function deployment on your new project to manufacture turbines that use alternative fuels. The first step you should use is to—**

a. Determine the voice of the customer

b. Build the house of quality

c. Address the functional requirements and how best to meet them

d. Hold a focus group of prequalified stakeholders

**16. On the WBS, the first level of decomposition may be displayed by using all the following EXCEPT—**

a. Phases of the project life cycle

b. Subcomponents

c. Major deliverables

d. Project organizational units

**17. Change is inevitable on projects. Uncontrolled changes are often referred to as—**

a. Rework

b. Scope creep

c. Configuration items

d. Emergency changes

**18. Each WBS component should be assigned a unique identifier from a code of accounts to—**

a. Link the WBS to the bill of materials

b. Enable the WBS to follow a similar numbering system to that of the organization’s units as part of the organizational breakdown structure

c. Sum costs, schedule, and resource information

d. Link the WBS to the project management plan

**19. In scope control it is important to determine the cause of any unacceptable variance relative to the scope baseline. This can be done through—**

a. Root cause analysis

b. Control charts

c. Inspections

d. Project performance measurements

**20. To assist your software development team in collecting requirements from potential users and to ensure that agreement about the stakeholders’ needs exists early in the project, you decide to use a group creativity tech­nique. Numerous techniques are available, but you and your team choose a voting process to rank the most useful ideas for further prioritization. This approach is known as—**

a. Brainstorming

b. Nominal group technique

c. Delphi technique

d. Affinity diagram

**21. You have been appointed project manager for a new project in your organization and must prepare a project management plan. You decide to prepare a WBS to show the magnitude and complexity of the work involved. No WBS templates are available to help you. To prepare the WBS, your first step should be to—**

a. Determine the cost and duration estimates for each project deliverable

b. Identify and analyze the deliverables and related work

c. Identify the components of each project deliverable

d. Determine the key tasks to be performed

**22. Assume that you are a major subcontractor doing work for a prime contractor on a major project. Your change control system should—**

a. Be identical to that of the prime contractor

b. Follow the rigor of international configuration management standards

c. Comply with relevant contractual provisions

d. Only consider approved change requests

**23. You are leading a project team to identify potential new products for your organization. One idea was rejected by management because it would not fit with the organiza­tion’s core competencies. You need to recommend other products using management’s guideline as—**

a. An assumption

b. A risk

c. A specification

d. A technical requirement

**24. Validate scope—**

a. Improves cost and schedule accuracy, particularly on projects using innovative techniques or technology

b. Is the last activity performed on a project before handoff to the customer

c. Documents the characteristics of the product or service that the project was undertaken to create

d. Differs from perform quality control in that validate scope is concerned with the acceptance—not the correctness—of the work results

**25. Any step recommended to bring expected future performance in line with the project management plan is called—**

a. Performance evaluation

b. Corrective action

c. Preventive action

d. Defect repair

**Answer Key (SCOPE)**

1. a. Proper project scope definition

Progressive elaboration of a project’s specification must be coordinated carefully with proper scope definition, particularly when the project is performed under contract. When properly defined, the project scope—the work to be done—should remain constant even when the product characteristics are elaborated progressively. [Planning]

PMI®, PMBOK® Guide, 2013, 6, 107–108

2. b. WBS

The WBS, along with the detailed scope statement and the WBS dictionary, defines the project’s scope baseline, which provides the basis for any changes that may occur on the project. [Planning]

PMI®, PMBOK® Guide, 2013, 131–132

3. b. Prepare a scope management plan

The work involved in the six Project Scope Management processes begins by preparing a scope management plan, which is a subsidiary plan for the project management plan. It describes the Project Scope Management processes from definition to control. [Planning]

 PMI®, PMBOK® Guide, 2013, 109–110

4. c. Historical information

Organizational process assets that can influence plan scope management include formal and informal policies, procedures, and guidelines impacting project scope management. Historical information and the lessons learned knowledge base are other examples. [Planning]

PMI®, PMBOK® Guide, 2013, 109

5. c. Product requirements

Completion of the project scope is measured against the project management plan, and completion of the product scope is measured against the requirements. In the project context, product scope consists of features and functions that characterize the product, service, or result. Project scope is the work that must be done to deliver the product, service, or result with specified features and functions. [Planning]

PMI®, PMBOK® Guide, 2013, 106

6. c. Expert judgment

Expert judgment is used to analyze the information needed to develop a project scope statement. It is applied to any technical details. [Planning]

PMI®, PMBOK® Guide, 2013, 122

7. d. Lateral thinking

Lateral thinking, brainstorming, and analysis of alter­natives are examples of alternatives generation that can be used to develop as many potential options as possible to execute and perform the project’s work. [Planning]

 PMI®, PMBOK® Guide, 2013, 123

8. d. Bill of materials

Product analysis techniques vary by application area, and each application area generally has accepted methods to translate project objectives into tangible deliverables and requirements. Other product analysis techniques include product breakdown, requirements analysis, and systems engineering. [Planning]

PMI®, PMBOK® Guide, 2013, 122

9. b. Project scope statement

Project exclusion identifies generally what is included within the project, and state explicitly what is excluded from the project, if a stakeholder might assume that a particular product, service, or result could be a project component. Project boundaries are described as part of the detailed project scope statement. [Planning]

PMI®, PMBOK® Guide, 2013, 123–124

10. b. An error or omission in defining the scope of the product

The bill of materials provides a hierarchical view of the physical assemblies, subassemblies, and com­ponents needed to build a manufactured product, whereas the WBS is a deliverable-oriented grouping of project components used to define the total scope of the project, providing a structured vision of what has to be delivered. Using a bill of materials where a WBS would be more appropriate may result in an ill-defined scope and subsequent change requests. [Monitoring and Controlling]

 PMI®, PMBOK® Guide, 2013, 125, 140; Ward 2008, 40

11. b. WBS

Collecting requirements provides the basis for defining project scope and product scope. It also involves determining, documenting, and managing stakeholder needs to meet project objectives. The requirements become the foundation for the WBS; moreover, cost, schedule, and quality planning are built upon the requirements. [Planning]

PMI®, PMBOK® Guide, 2013, 110, 127

12. d. Project management methodology (PMM)

The PMM is an organization-approved approach for project management that is used on every project. It is not part of the project scope statement, which describes the project scope, major deliverables, assumptions, and constraints. It describes the project’s deliverables and the work required to complete them. [Planning]

PMI®, PMBOK® Guide, 2013, 123–124

13. b. Review the scope management plan

The scope management plan is reviewed first as it provides clarity as to how the project team will determine which requirements need to be collected on the project. [Planning]

PMI®, PMBOK® Guide, 2013, 113

14. a. Deliverable at the lowest level of the WBS

A work package is the lowest or smallest unit of work division in a project or WBS. The work pack­age can be scheduled, cost estimated, monitored, and controlled. [Planning]

 PMI®, PMBOK® Guide, 2013, 126

15. a. Determine the voice of the customer

Quality function deployment is an example of a facilitated workshop used in the manufacturing industry as a tool and technique to collect require­ments. It helps to determine the critical characteristics for new product development and starts by collecting customer needs, known as the voice of the customer. [Planning]

PMI®, PMBOK® Guide, 2013, 114

16. d. Project organizational units

The WBS includes all work needed to be done to complete the project. The organizational breakdown structure (OBS) includes the organizational units responsible for completing the work. [Planning]

PMI®, PMBOK® Guide, 2013, 126, 548

17. b. Scope creep

Project scope creep is typically the result of uncon­trolled changes. Scope control works to control the impact of any project scope changes. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 137

18. c. Sum costs, schedule, and resource information

The key document generated from the create WBS process is the actual WBS. Each WBS component is assigned a unique identifier to provide a structure for hierarchical summation of costs, schedule, and resource information. [Planning]

 PMI®, PMBOK® Guide, 2013, 132

19. d. Project performance measurements

Variance analysis is a tool and technique for control scope. Project performance measurements are used to assess the magnitude of variance, to determine the cause of the variance, and to decide whether correc­tive or preventive action is required. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 139

20. b. Nominal group technique

The nominal group technique enhances brainstorm­ing with a voting process, which is used to rank the most useful ideas for further brainstorming or for prioritization. [Planning]

PMI®, PMBOK® Guide, 2013, 115

21. b. Identify and analyze the deliverables and related work

Identifying and analyzing the deliverables and related work is the first step in the decomposition of a project. The deliverables should be defined in terms of how the project will be organized. For example, the major project deliverables may be used as the second level. [Planning]

PMI®, PMBOK® Guide, 2013, 128–129

22. c. Comply with relevant contractual provisions

In addition to complying with any relevant contractual provisions, scope change control must be integrated with the project’s overall change control system and with any systems in place to control project and product scope. [Monitoring and Controlling]

 PMI®, PMBOK® Guide, 2013, 96, 137

23. a. An assumption

Assumptions are factors that, for planning purposes, are considered to be true, real, or certain without proof or demonstration. They are listed in the project scope statement. [Planning]

Ward 2008, 24; PMI®, PMBOK® Guide, 2013, 124 and 529

24. d. Differs from perform quality control in that validate scope is concerned with the acceptance—not the correctness—of the work results

Documentation that the customer has accepted completed deliverables is an output of validate scope. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 134

25. b. Corrective action

Recommended corrective action is an output from control scope. In addition to bringing expected future performance in line with the project manage­ment plan, it also serves to bring expected future performance in line with the project scope statement. [Monitoring and Controlling]

 PMI®, PMBOK® Guide, 2013, 140, 534

**TIME**

**1. Your company, which operates one of the region’s largest chemical processing plants, has been convicted of illegally dumping toxic substances into the local river. The court has mandated that the required cleanup activities be completed by February 15. This date is an example of—**

a. A key event

b. A milestone

c. A discretionary dependency

d. An external dependency

**2. You are managing a construction project for a new city water system. The contract requires you to use special titanium piping equipment that is guaranteed not to corrode. The titanium pipe must be resting in the ground a total of 10 days before connectors can be installed. In this example, the 10-day period is defined as—**

a. Lag

b. Lead

c. Float

d. Slack

**3. Of the following tools and techniques, which one is NOT used for schedule control?**

a. Fast tracking

b. What-if scenario analysis

c. Three-point estimates

d. Adjusting leads and lags

**4. You are planning to conduct the team-building portion of your new project management training curriculum out-of-doors in the local park. You are limited to scheduling the course at certain times of the year, and the best time for the course to begin is mid-July. One of the more common date constraints to use as you develop the project schedule is—**

a. “Start no earlier than”

b. “Finish no earlier than”

c. “Fixed late start”

d. “Fixed early finish”

**5. Project schedule development is an iterative process. If the start and finish dates are not realistic, the project probably will not finish as planned. You are working with your team to define how to manage schedule changes. You documented your decisions in which of the following?**

a. Schedule change control procedures

b. Schedule management plan

c. Schedule risk plan

d. Service-level agreement

**6. If, when developing your project schedule, you want to define a distribution of probable results for each schedule activity and use that distribution to calculate another distribution of probable results for the total project, the most common technique to use is—**

a. PERT

b. Monte Carlo analysis

c. Linear programming

d. Concurrent engineering

**7. Your lead engineer estimates that a work package will most likely require 50 weeks to complete. It could be completed in 40 weeks if all goes well, but it could take 180 weeks in the worst case. What is the PERT estimate for the expected duration of the work package?**

a. 45 weeks

b. 70 weeks

c. 90 weeks

d. 140 weeks

**8. Your customer wants the project to be completed six months earlier than planned. You believe you can meet this target by overlapping project activities. The approach you plan to use is known as—**

a. Critical chain

b. Fast tracking

c. Leveling

d. Crashing

**9. Activity A has a duration of three days and begins on the morning of Monday the 4th. The successor activity, B, has a finish-to-start relationship with A. The finish-to-start relationship has three days of lag, and activity B has a duration of four days. Sunday is a nonworkday. Such data can help to determine—**

a. The total duration of both activities is 8 days

b. Calendar time between the start of A to the finish of B is 11 days

c. The finish date of B is Wednesday the 13th

d. Calendar time between the start of A to the finish of B is 14 days

**10. You can use various estimating approaches to determine activity durations. When you have a limited amount of information available about your project, especially when in the early phases, the best approach to use is—**

a. Bottom-up estimating

b. Analogous estimating

c. Reserve analysis

d. Parametric analysis

**11. “I cannot test the software until I code the software.” This expression describes which of the following dependencies?**

a. Discretionary

b. Rational

c. Preferential

d. Mandatory or hard

**12. Working with your team to provide the basis for measuringand reporting schedule progress, you agree to use the—**

a. Schedule management plan

b. Network diagram

c. Project schedule

d. Technical baseline

**13. Your approved project schedule was based on resource leveling because of a scarcity of resources. Management has now mandated that the project be completed as soon as possible. Which of the following methods will you use to recalculate the schedule?**

a. Resource manipulation

b. Reverse resource allocation

c. Critical chain scheduling

d. Resource reallocation

**14. You are remodeling your kitchen and decide to prepare a network diagram for this project. Your appliances must be purchased and available for installation by the time the cabinets are completed. In this example, these relationships are—**

a. Start-to-finish

b. Finish-to-start

c. Start-to-start

d. Finish-to-finish

**15. Decomposition is a technique used for both WBS devel­opment and activity definition. Which following statement best describes the role decomposition plays in activity definition as compared to creating the WBS?**

a. Final output is described in terms of work packages in the WBS.

b. Final output is described as deliverables or tangible items.

c. Final output is described as schedule activities.

d. Decomposition is used the same way in scope definition and activity definition.

**16. When sequencing project activities in the schedule, all the following are true EXCEPT—**

a. There may be scheduled dates for specific milestones

b. Every activity is connected to at least one predecessor and at least one successor

c. Lead or lag time may be required

d. Necessary sequencing of events may be described by the activity attributes

**17. A schedule performance index of less than 1.0 indicates that the—**

a. Project is running behind the monetary value of the work it planned to accomplish

b. Earned value physically accomplished thus far is 100%

c. Project has experienced a permanent loss of time

d. Project may not be on schedule, but the project manager need not be concerned

**18. Various tools and techniques are available to sequence activities, and several factors can help to determine which tool or technique to select. When a project manager decides to include sub-networks or a fragment network as part of his or her scheduling technique, what does this decision say about the project?**

a. The work is unique requiring special network dia­grams at various stages.

b. Software that manages resources is available over an existing electronic network.

c. Several identical or nearly identical series of activities are repeated throughout the project.

d. Multiple critical paths exist in the project.

**19. To meet regulatory requirements, you need to crash your project schedule. Your first step is to compute—**

a. The cost and time slope for each critical activity that can be expedited

b. The cost of additional resources to be added to the project’s critical path

c. The time saved in the overall schedule when tasks are expedited on the critical path

d. Three probabilistic time estimates of PERT for each critical path activity

**20. Which one of the following is a key input to the define activities process?**

a. Project management plan

b. Project scope statement

c. Project scope baseline

d. Project charter

**21. Unlike bar charts, milestone charts show—**

a. Scheduled start or completion of major deliverables and key external interfaces

b. Activity start and end dates of critical tasks

c. Expected durations of the critical path

d. Dependencies between complementary projects

**22. Project managers should pay attention to critical and subcritical activities when evaluating project time performance. One way to do this is to analyze 10 subcriticalpaths in order of ascending float. This approach is part of—**

a. Variance analysis

b. Simulation

c. Earned value management

d. Trend analysis

**23. An activity has an early start date of the 10th and a late start date of the 19th. The activity has a duration of four days. There are no nonworkdays. From the information given, what can be concluded about the activity?**

a. Total float for the activity is nine days.

b. The early finish date of the activity is the end of the day on the 14th.

c. The late finish date is the 25th.

d. The activity can be completed in two days if the resources devoted to it are doubled.

**24. In project development, schedule information such as who will perform the work, where the work will be performed, activity type, and WBS classification are examples of—**

a. Activity attributes

b. Constraints

c. Data in the WBS repository

d. Refinements

**25. Which of the following is a key input to define activities?**

a. Project management plan

b. Project scope management plan

c. Schedule management plan

d. Project management software

**Answer Key (TIME)**

1. b. A milestone

A milestone is a significant point or event in the project. Milestones may be required by the project sponsor, customer, or other external factors for the completion of certain deliverables. They are similar to schedule activities, with the same structure and objectives, but they have zero duration as they represent a moment in time. [Planning]

 PMI®, PMBOK® Guide, 2013, 153

2. a. Lag

For example, in a finish-to-start dependency with a 20-day lag, the successor activity cannot start until 20 days after the predecessor has finished. [Planning]

PMI®, PMBOK® Guide, 2013, 158–159

3. c. Three-point estimates

Three-point estimates are used to determine the estimates that go into the schedule. [Planning and Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 170–171, 188–190

4. a. “Start no earlier than”

Imposed dates on schedule activity starts of finishes can be used to restrict the start of finish to occur either no earlier than a specified date or no later than a specified date. Although all four date constraints typically are available in project management soft­ware, “start no earlier than” and “finish no later than” constraints are more commonly used. [Planning]

PMI®, PMBOK® Guide, 2013, 543

5. b. Schedule management plan

The schedule management plan is part of the overall project management plan and defines, among other things, how schedule changes will be managed. Whether it is formal or informal, highly detailed or broadly framed, it generally is based on specific project needs. [Planning]

 PMI®, PMBOK® Guide, 2013, 148–149

6. b. Monte Carlo analysis

What-if scenarios (simulation) is a tool and technique for developing schedules by which multiple project durations with different sets of activity assumptions are calculated. Monte Carlo analysis is the most commonly used simulation technique. [Planning]

PMI®, PMBOK® Guide, 2013, 180

7. b. 70 weeks

*E(t)*=Optimistic+(4xMostlikely)+Pessimistiic=40+200+1806=4206=70weeks6

[Planning]

PMI®, PMBOK® Guide, 2013, 170–171

8. b. Fast tracking

Fast tracking is a way to accelerate the project schedule. [Planning]

 PMI®, PMBOK® Guide, 2013, 181, 190, and 540

9. b. Calendar time between the start of A to the finish of B is 11 days

The duration of A, which is three, is added to the duration of B, which is four, for a total of seven. The three days between the activities is lag and not duration. The lag is a constraint and must be taken into account as part of the network calculations, but it does not consume resources. The total time by the calendar is 11 days as counted from the morning of Monday the 4th. The lag occurs over Thursday, Friday, and Saturday. Sunday is a nonworkday, so activity B does not start until Monday the 11th. Therefore, the calendar time is 11 days, and activity B ends on Thursday the 14th. [Planning]

PMI®, PMBOK® Guide, 2013, 156, 158–159, and 180

10. b. Analogous estimating

Although limitations exist with all estimating approach, analogous estimating is often used when there is a limited amount of information for the project. It uses historical information and expert judgment. [Planning]

PMI®, PMBOK® Guide, 2013, 169

11. d. Mandatory or hard

Mandatory dependencies may be required contractu­ally or be inherent in the nature of the project work. They describe a relationship in which the successor activity cannot be started because of physical constraints until the predecessor activity has been finished. For example, software cannot be tested until it has been developed (or coded). They should not be confused with assigning schedule constraints in the scheduling tool. [Planning]

 PMI®, PMBOK® Guide, 2013, 157

12. c. Project schedule

The approved project schedule is a key input to schedule control. It is the schedule baseline, as it is the approved version of a schedule model, and it provides the basis for measuring and reporting schedule performance. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 181,187

13. d. Resource reallocation

While resource leveling will often result in a project duration that is longer than the preliminary schedule as the original critical path probably will change and increase, it can also be used to get a schedule back on track by reassigning activities from noncritical to critical path activities. [Planning]

 PMI®, PMBOK® Guide, 2013, 179

14. d. Finish-to-finish

The completion of the work of the successor activity depends upon the completion of the work of the predecessor activity. [Planning]

 PMI®, PMBOK® Guide, 2013, 156

15. c. Final output is described as schedule activities.

In the create WBS process, final output is described as deliverables or tangible items. In the define activities process, final output is described as activities. [Planning]

PMI®, PMBOK® Guide, 2013, 151

16. b. Every activity is connected to at least one predecessor and at least one successor

The sequence activity process involves identifying and documenting relationships among the project activities. However, the last activity or milestone are not connected to at least one successor. [Planning]

PMI®, PMBOK® Guide, 2013, 156

17. a. Project is running behind the monetary value of the work it planned to accomplish

The SPI represents how much of the originally scheduled work has been accomplished at a given period in time, thus providing the project team with insight as to whether the project is on schedule. [Monitoring and Controlling]

 PMI®, PMBOK® Guide, 2013, 189–190, 224

18. c. Several identical or nearly identical series of activities are repeated throughout the project.

When identical network descriptions are repeated throughout a project, templates of those activities can be developed. If those series of tasks are repeated several times, the template can be updated several times. Software can be used with the templates to facilitate documenting and adapting them for future use. The sub-network or fragment tends to represent a sub-project or a work package and is often used to illustrate or study some potential or proposed schedule condition, such as a change in preferential schedule logic or the scope of the project. [Planning]

PMI®, PMBOK® Guide, 2013, 564

19. a. The cost and time slope for each critical activity that can be expedited

Slope = (Crash cost – Normal cost)/(Crash time – Normal time). This calculation shows the cost per day of crashing the project. The slope is negative to indicate that as the time required for a project or task decreases, the cost increases. If the costs and times are the same regardless of whether they are crashed or normal, the activity cannot be expedited. [Planning]

PMI®, PMBOK® Guide, 2013, 181

20. c. Project scope baseline

The scope baseline—made up of the scope state­ment, WBS, and WBS dictionary—is a key input to the define activities process and are used to develop the activity list that subsequently will help to create the schedule. [Planning]

 PMI®, PMBOK® Guide, 2013, 151

21. a. Scheduled start or completion of major deliverables and key external interfaces

Milestones are singular points in time, such as the start or completion of a significant activity or group of activities. [Planning]

PMI®, PMBOK® Guide, 2013, 182

22. a. Variance analysis

Performance of variance analysis during the schedule monitoring process is a key element of time control. Float variance is an essential planning component for evaluating project time performance. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 189

23. a. Total float for the activity is nine days.

Total float or slack is computed by subtracting the early start date from the late start date, or 19 – 10 = 9. To compute the early finish date given a duration of 4, we would start counting the activity on the morning of the 10th; therefore, the activity would be com­pleted at the end of day 13, not 14 (10, 11, 12, 13). If we started the activity on its late start date on the morning of the 19th, we would finish at the end of day 22, not 25. Insufficient information is provided to determine whether this activity can be completed in 2 days if the resources are doubled. [Planning]

 PMI®, PMBOK® Guide, 2013, 177

24. a. Activity attributes

Identifying activity attributes is helpful for further selection and sorting of planned activities. They are used for schedule development and for report formatting purposes. [Planning]

PMI®, PMBOK® Guide, 2013, 153

25. c. Schedule management plan

While there are a number of inputs to define activities, the schedule management plan is a key input. It shows the level of detail necessary to manage the work. [Planning]

 PMI®, PMBOK® Guide, 2013, 150

**QUALITY**

**1. Quality is very important to your company. Each project has a quality statement that is consistent with the orga­nization’s vision and mission. Both internal and external quality assurance are provided on all projects to—**

a. Ensure confidence that the project will satisfy relevant quality standards

b. Monitor specific project results to note whether they comply with relevant quality standards

c. Identify ways to eliminate causes of unsatisfactory results

d. Use inspection to keep errors out of the process

**2. Benchmarking is a technique used in—**

a. Inspections

b. Root cause analysis

c. Plan quality management

d. Perform quality control

**3. In quality management, the practice “rework” is—**

a. Acceptable under certain circumstances

b. An adjustment made that is based on quality control measurements

c. Action taken to bring a defective or nonconforming component into compliance

d. Not a concern if errors are detected early

**4. The quality function deployment process is used to—**

a. Provide better product definition and product development

b. Help products to succeed in the marketplace

c. Improve the functional characteristics of a product

d. Support production planning and the just-in-time approach

**5. As it applies to quality, the law of diminishing returns says that—**

a. 100% quality is unattainable

b. 100% inspection is not cost effective

c. Beyond a certain point, additional investment in quality has a negative ROI

d. Providing quality products will stop, or at least dimin­ish, the number of returned items

**6. You are leading a research project that will require between 10 and 20 aerospace engineers. Some senior-level aerospace engineers are available. They are more productive than junior-level engineers, who cost less and who are available as well. You want to determine the optimal combination of senior- and junior-level personnel. In this situation, the appropriate technique to use is to—**

a. Conduct a design of experiments

b. Use the Ishikawa diagram to pinpoint the problem

c. Prepare a control chart

d. Analyze the process using a Pareto diagram

**7. The purpose of the Taguchi method is to—**

a. Manage the flow of material for better visibility and control

b. Use statistical techniques to compute a “loss function” to determine the cost of producing products that fail to achieve a target value

c. Design, group, and manage production operations as self-contained flexible cells capable of start-to-finish processing of a family of items

d. Regulate coordination and communication among process stages

**8. Quality assurance promotes quality improvement. A “breakthrough” is the accomplishment of any improve­ment that takes the organization to unprecedented levels of performance by attacking—**

a. Special causes of variation

b. Common causes of variation

c. Inspection over prevention

d. Specific tolerances

**9. Which of the following statements best describes attribute sampling versus variables sampling?**

a. Attribute sampling is concerned with prevention, whereas variables sampling is concerned with inspection.

b. Attribute sampling is concerned with conformance, whereas variables sampling is concerned with the degree of conformity.

c. Attribute sampling is concerned with special causes, whereas variables sampling is concerned with any causes.

d. Both are the same concept.

**10. Your project scheduler has just started working with your project and has produced defective reports for the past two accounting cycles. If this continues, these defective reports could provide the potential for customer dissatisfaction and lost productivity that is due to rework. You discovered that the project scheduler needs addi­tional training on using the scheduling tool that is used on your project. The cost of training falls under which one of the following categories?**

a. Overhead costs

b. Failure costs

c. Prevention costs

d. Indirect costs

**11. When a process is within acceptable limits, it—**

a. Should not be adjusted

b. May not be changed to provide improvements

c. Shows differences caused by expected events or normal causes

d. Should not be inspected or reworked for any reason

**12. The project team should have a working knowledge of statistical process control to help evaluate control quality outputs. Of all the topics involved, which of the following is the most important for the team to understand?**

a. Sampling and probability

b. Attribute sampling and variables sampling

c. Tolerances and control limits

d. Special causes and random causes

**13. Rank ordering of defects should be used to guide corrective action. This is the underlying principle behind—**

a. Trend analysis

b. Inspections

c. Control charts

d. Pareto diagrams

**14. Project quality management was once thought to include only inspection or quality control. In recent years, the concept of project quality management has broadened. Which statement is NOT representative of the new defini­tion of quality management?**

a. Quality is designed into the product or service, not inspected into it.

b. Quality is the concern of the quality assurance staff.

c. Customers require a documented and, in some cases, registered quality assurance system.

d. National and international standards and guidelines for quality assurance systems are available.

**15. Assume you wish to provide a process to be more creative in problem solving as on your project you have a somewhat complex scenario that possesses intertwined logical relationships for up to 50 items. The best approach is to—**

a. Design an experiment

b. Use an interrelationship diagraph

c. Conduct a Monte Carlo analysis

d. Use a process decision program chart

**16. Your quality assurance department recently performed a quality audit of your project and identified a number of findings and recommendations. One recommendation seems critical and should be implemented because it affects successful delivery of the product to your customer. Your next step should be to—**

a. Call a meeting of your project team to see who is responsible for the problem

b. Reassign the team member who had responsibility for oversight of the problem

c. Perform product rework immediately

d. Issue a change request to implement the needed corrective action

**17. Six sigma refers to the aim of setting tolerance limits at six standard deviations from the mean, whereas the normally expected deviation of a process is—**

a. One standard deviation

b. Two standard deviations

c. Three standard deviations

d. Undeterminable because of the unique nature of every process

**18. You recognize the importance of quality control on your project. However, you also know that quality control has costs associated with it and that the project has a limited budget. One way to reduce the cost of quality control is to—**

a. Work to ensure that the overall quality program is ISO compliant

b. Use statistical sampling

c. Conduct inspections throughout the process

d. Use trend analysis

**19. Deming’s Fourteen Points provide a way for an orga­nization to create and sustain a culture of continuous improvement. As such it should be directed by—**

a. The project manager

b. Top management

c. Employees participating in quality circles

d. Stakeholders

**20. Quality inspections also may be called—**

a. Control tests

b. Walkthroughs

c. Statistical sampling

d. Checklists

**21. Your management has prescribed that a quality audit be conducted at the end of every phase in a project. This audit is part of the organization’s—**

a. Quality assurance process

b. Quality control process

c. Quality improvement program

d. Process adjustment program

**22. You are managing a major international project, and your contract requires you to prepare both a project plan and a quality management plan. Your core team is preparing a project quality management plan. Your first step in developing this plan is to—**

a. Determine specific metrics to use in the quality management process

b. Identify the quality standards for the project

c. Develop a quality policy for the project

d. Identify specific quality management roles and responsibilities for the project

**23. Recently your company introduced a new set of “metal woods” to its established line of golfing equipment. However, in the past weeks many of the clubs have been returned because of quality problems. You decide to conduct a failure mode and criticality analysis to—**

a. Analyze the product development cycle after product release to determine strengths and weaknesses

b. Evaluate failure modes and causes associated with the design and manufacture of this product

c. Evaluate failure modes and causes associated with the design and manufacture of a new product to replace the clubs

d. Help management set priorities in its existing manufacturing processes to avoid failures

**24. The “rule of seven” as applied to statistical process control charts means that—**

a. Seven rejects typically occur per thousand inspections

b. Seven consecutive points are above or below the mean

c. At least seven inspectors should be in place for every thousand employees

d. A process is not out of control even though seven measurements fall outside the lower and upper control limits

**25. Long-term contracting is an important aspect of project quality management because it—**

a. Provides incentives to vendors to make quality commitments

b. Improves quality through the use of benefit-cost ratio

c. Usually results in lower costs and increased profitability

d. Provides for periodic, yet mandatory quality audits

**Answer Key (Quality)**

1. a. Ensure confidence that the project will satisfy relevant quality standards

Quality assurance increases project effectiveness and efficiency and provides added benefits to project stakeholders. It includes all the planned and systematic quality activities to ensure that the project uses all the processes to meet requirements. Quality assuranceshould be performed throughout the project. [Executing]

PMI®, PMBOK® Guide, 2013, 227, 242–244

2. c. Plan quality management

Benchmarking involves comparing actual or planned practices to those practices of comparable projects to identify best practices, to note ideas for improve­ment, and to provide a way to measure performance. [Planning]

PMI®, PMBOK® Guide, 2013, 239

3. c. Action taken to bring a defective or nonconforming component into compliance

Rework is a frequent cause of project overruns. The project team must make every reasonable effort to control and minimize rework so that defective or nonconforming components are brought into compliance with requirements or specifications. [Monitoring and Controlling]

 PMI®, PMBOK® Guide, 2013, 559

4. a. Provide better product definition and product development

Quality function deployment helps a design team to define, design, manufacture, and deliver a product or service to meet or exceed customer needs. Its main features are to capture the customer’s requirements, ensure cross-functional teamwork, and link the main phases of product development—product planning, part deployment, process planning, and production planning. [Planning]

PMI®, PMBOK® Guide, 2013, 556

5. c. Beyond a certain point, additional investment in quality has a negative ROI

If a company has paid $100,000 to gain 98% quality and it would cost an additional $25,000 to gain the other 2%, this is known as the law of diminishing returns.

6. a. Conduct a design of experiments

This technique is used to identify which variables have the most influence. It is a statistical method to identify the factors that may influence specific vari­ables of a product or process under development or in production. For example, roller blade designers might want to determine which combination of number of wheels and titanium ball bearings would produce the most desirable “ride” characteristics at a reasonable cost. This technique, however, can be applied to project management issues such as cost and schedule trade-offs. An appropriately designed “experiment” often will help project managers to find an optimal solution from a relatively limited number of options, and often it help to determine the number and type of tests to use and their impact on quality. [Planning]

PMI®, PMBOK® Guide, 2013, 239–240

7. b. Use statistical techniques to compute a “loss function” to determine the cost of producing products that fail to achieve a target value

The Taguchi method is used to estimate the loss associated with controlling or failing to control process variability. It is based on the principle that by carefully selecting design parameters to produce robust designs, an organization can produce products that are more forgiving and tolerant. The tool helps determine the value or break-even point of improving a process to reduce variability. [Monitoring and Controlling]

8. b. Common causes of variation

Quality improvement includes action taken to increase project effectiveness and efficiency in order to provide added benefits to stakeholders. A breakthrough attacks chronic losses, or in Deming’s terminology, common causes of variation. [Executing]

9. b. Attribute sampling is concerned with conformance, whereas variables sampling is concerned with the degree of conformity.

Attribute sampling determines whether a result does or does not conform. Variables sampling rates a result on a continuous scale to measure the degree of conformity. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 250

10. c. Prevention costs

Prevention costs include any expenditure directed toward ensuring that quality is achieved the first time. [Planning]

PMI®, PMBOK® Guide, 2013, 235

11. a. Should not be adjusted

Processes should be changed only through estab­lished change procedures. If the process is outside acceptable limits, it should be adjusted. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 238, 252–253

12. a. Sampling and probability

Sampling and probability form the basis of statistical process control, which helps the team monitor project results for compliance with relevant quality standards so that methods can be identifiedto eliminate causes of unsatisfactory results. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 240, 252

13. d. Pareto diagrams

Pareto diagrams are histograms, ordered by fre­quency of occurrence, that show how many results were generated by type or category of identified cause. The project team should take action to fix the problems that are causing the greatest number of defects first. Pareto diagrams are based on Pareto’s Law, which holds that a relatively small number of causes will typically produce a large majority of defects, also called the “solzo rule.” [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 237,252

14. b. Quality is the concern of the quality assurance staff.

Quality concerns all levels of management and staff. Its success requires participation from all members of the project team with management providing the needed resources to succeed. [Planning, Executing, and Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 227–229

15. b. Use an interrelationship diagraph

In perform quality assurance, the interrelationship diagraph can be used as a quality management and control tool. It may be developed from data gen­erated by other quality tools such as the affinity diagram, the tree diagram, or the cause-and-effect diagram. It is an adoption of relationship diagrams. [Executing]

PMI®, PMBOK® Guide, 2013, 245

16. d. Issue a change request to implement the needed corrective action

The information obtained from a quality audit can be used to improve quality systems and performance. In most cases, implementing quality improvements requires preparation of change requests. [Executing]

PMI®, PMBOK® Guide, 2013, 247

17. c. Three standard deviations

When the results of a sample of items measured falls within three standard deviations and that sample is representative of the entire population, you can assume that more than 99% of all items fall within that range. This generally accepted range of results has been used by quality control professionals through the years. Six sigma is a program started by Motorola that, from a statistical standpoint, indicates a quality +standard of only 3.4 defects per million. [Planning and Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 238, 252

18. b. Use statistical sampling

Statistical sampling uses part of a population to draw conclusions about the total population. It is a well-proven technique that can significantly reduce the cost of quality control. [Monitoring and Controlling]+

PMI®, PMBOK® Guide, 2013, 240, 252

19. b. Top management

Deming is known as a quality pioneer. His approach to quality is not only statistically based but focuses on what management’s responsibilities should be with respect to quality. His Fourteen Points for management are goals of quality for transforming business. [Executing]

20. b. Walkthroughs

Inspections comprise an examination of a work product to determine if it conforms to standards. Additional names for inspections are audits, reviews, or peer reviews (in some application areas, these terms may have narrow and specific meanings). [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 252

21. a. Quality assurance process

Quality assurance is a managerial function that establishes processes or procedures in an organization or project to assist in determining whether quality standards and operational definitions are being met. It is the application of planned, systematic quality activities to ensure that the project will use all pro­cesses needed to meet requirements and is performed throughout the life of the project. Quality audits are a tool and technique to use. [Executing]

PMI®, PMBOK® Guide, 2013, 242–243

22. c. Develop a quality policy for the project

The quality policy includes the overall intentions and direction of the organization with regard to quality, as formally expressed by top management. If the performing organization lacks a formal quality policy or if the project involves multiple performing organi­zations, as in a joint venture, the project management team must develop a quality policy for the project. The quality management plan then describes how the quality policies will be implemented. [Planning]

PMI®, PMBOK® Guide, 2013, 234, 241

23. c. Evaluate failure modes and causes associated with the design and manufacture of a new product to replace these clubs

This technique is a method of analyzing design reli­ability. A list of potential failure modes is developed for each element, and then each mode is given a numeric rating for frequency of occurrence, criticality, and prob­ability of detection. These data are used to assign a risk priority number for prioritizing problems and guiding the design effort. [Monitoring and Controlling]

Evans and Lindsay 2005, 582–594

24. b. Seven consecutive measurements are above or below the mean

Consecutive points on a control chart that are above or below the mean or if a point exceeds a control limit indicate an abnormal trend in the process and must be investigated. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 228, 252

25. a. Provides incentives to vendors to make quality commitments

Vendors that have long-term relationships with buyers are generally more inclined to invest in process and quality improvement, because they have a higher probability of recovering their costs. The stability provided through longer-term contracts permits better planning and encourages better com­munication and partnering between the buyer and the seller. Long-term contracting with fewer vendors also reduces buyer-related costs by simplifying accounting, collections, and other administrative tasks. [Planning]

Rose 2005, 87–88

**RISK**

**1. A risk response strategy that can be used for both threats and opportunities is—**

a. Share

b. Avoid

c. Accept

d. Transfer

**2. The risk urgency assessment is a tool and technique used for—**

a. Plan risk responses

b. Identify risks

c. Perform qualitative risk analysis

d. Perform quantitative risk analysis

**3. Projects are particularly susceptible to risk because—**

a. Murphy’s law states that “if something can go wrong, it will”

b. There is uncertainty in all projects

c. Project management tools are generally unavailable at the project team level

d. There are never enough resources to do the job

**4. As project manager, you have assembled the team to prepare a comprehensive list of project risks. Which one of the following documents would be the most helpful in this process?**

a. OBS

b. WBS

c. RBS

d. CBS

**5. You are working on identifying possible risks to your project to develop a nutritional supplement. You want to develop a comprehensive list of risks that can be addressed later through qualitative and quantitative risk analysis. An information gathering technique used to identify risks is—**

a. Documentation reviews

b. Probability and impact analysis

c. Checklist analysis

d. Brainstorming

**6. The Delphi technique is a particularly useful method for identifying risks to—**

a. Present a sequence of decision choices graphically to decision makers

b. Define the probability of occurrence of specific variables

c. Reduce bias in the analysis and keep any one person from having undue influence on the outcome

d. Help take into account the attitude of the decision maker toward risk

**7. A workaround is—**

a. An unplanned response to a negative risk event

b. A plan of action to follow when something unexpected occurs

c. A specific response to certain types of risk as described in the risk management plan

d. A proactive, planned method of responding to risks

**8. Most statistical simulations of budgets, schedules, and resource allocations use which one of the following approaches?**

a. PERT

b. Decision-tree analysis

c. Present value analysis

d. Monte Carlo analysis

**9. A project health check identified a risk that your project would not be completed on time. As a result, you are quantifying the project’s risk exposure and determining what cost and schedule contingency reserves might be needed. You performed a schedule risk analysis using Monte Carlo analysis. The basis for your schedule risk analysis is the—**

a. WBS

b. Gantt chart

c. Schedule network diagram and duration estimates

d. Probability/impact risk rating matrix

**10. You are developing radio frequency (RF) technology that will improve overnight package delivery. You ask each stakeholder to estimate the most optimistic pack­age delivery time using the RF technology, the most pessimistic time, and the most likely time. This shows that for your next step you plan to—**

a. Use a beta or triangular probability distribution

b. Conduct a sensitivity analysis

c. Structure a decision analysis as a decision tree

d. Determine the strategy for risk response

**11. Each one of the following statements about risk avoidance is true EXCEPT that it—**

a. Focuses on changing the project management plan to eliminate entirely the threat

b. Isolates the project’s objectives from the risk’s impact

c. Accepts the consequences of the risk event should it occur

d. Changes the project objective that is in jeopardy

**12. If the probability of event 1 is 80 percent and of event 2 is 70 percent and they are independent events, how likely is it that both events will occur?**

a. 6 percent

b. 15 percent

c. 24 percent

d. 56 percent

**13. The project scope statement should be used in the identify risk process because it—**

a. Identifies project assumptions

b. Identifies all the work that must be done and, there­fore, includes all the risks on the project

c. Helps to organize all the work that must be done on the project

d. Contains information on risks from prior projects

**14. Your project team has identified all the risks on the project and has categorized them as high, medium, and low. The “low” risks are placed on which one of the following for monitoring?**

a. Threat list

b. Low risk list

c. Watch list

d. Low impact list

**15. A general contingency is used for—**

a. Risks that are identified at the outset of the project

b. Risks that are not identified at the outset of the project but are known before they occur

c. Risks that cannot be known before they occur because they are external risks

d. Any risks that cannot be known before they occur

**16. The simplest form of quantitative risk analysis and modeling techniques is—**

a. Probability analysis

b. Sensitivity analysis

c. Delphi technique

d. Utility theory

**17. The highest risk impact generally occurs during which one of the following project life-cycle phases?**

a. Concept and planning

b. Planning and implementation

c. Implementation and closeout

d. Concept and closeout

**18. You are managing the construction of a highly sophisti­cated data center in Port Moresby, Papua, New Guinea. Although this location offers significant economic advan­tages, the threat of typhoons has caused you to create a backup plan to operate in Manila in case the center is flooded. This plan is an example of what type of risk response?**

a. Passive avoidance

b. Mitigation

c. Active acceptance

d. Deflection

**19. A recent earned value analysis shows that your project is 20 percent complete, the CPI is 0.67, and the SPI is 0.87. In this situation, you should—**

a. Perform additional resource planning, add resources, and use overtime as needed to accomplish the same amount of budgeted work

b. Rebaseline the schedule, then use Monte Carlo analysis

c. Conduct a risk response audit to help control risk

d. Forecast potential deviation of the project at comple­tion from cost and schedule targets

**20. The purpose of a numeric scale in risk management is to—**

a. Avoid high-impact risks

b. Assign a relative value to the impact on project objectives if the risk in question occurs

c. Rank order risks in terms of very low, low, moderate, high, and very high

d. Test project assumptions

**21. Risk score measures the—**

a. Variability of the estimate

b. Product of the probability and impact of the risk

c. Range of schedule and cost outcomes

d. Reduced monetary value of the risk event

**22. Which of the following is an example of recommended corrective action in risk management?**

a. Conducting a risk audit

b. Engaging in additional risk response planning

c. Performing the contingency plan

d. Conducting a risk review

**23. The primary advantage of using decision-tree analysis in project risk management is that it—**

a. Considers the attitude of the decision maker toward risk

b. Forces consideration of the probability of each outcome

c. Helps to identify and postulate risk scenarios for the project

d. Shows how risks can occur in combination

**24. Your project is using complex, unproven technology. Your team conducted a brainstorming session to identify risks. Poor allocation of project resources was the number one risk. This risk was placed on the risk register, which included at this point a—**

a. Watch list

b. Potential risk response

c. Known unknown

d. List of other risks requiring additional analysis

**25. When managing current projects, it is important to use lessons learned from previous projects to improve the organization’s project management process. Therefore, in project closing procedures, it is important to review the—**

a. Secondary risks that occurred

b. Checklists for identify risks

c. WBS dictionary

d. Fallback plan

**Answer Key (Risk)**

1. c. Accept

Risk exists on every project, and it is unrealistic to think it can be eliminated completely. There are certain risks that simply must be accepted because we cannot control whether or not they will occur (for example, an earthquake). Acceptance is a strategyfor dealing with risk that can be used for both threats and opportunities. [Planning]

PMI®, PMBOK® Guide, 2013, 345–346

2. c. Perform qualitative risk analysis

Risks that may happen in the near-term need urgent attention. The purpose of the risk urgency assess­ment is to identify those risks that have a high like­lihood of happening sooner rather than later. It is combined with the risk ranking to give a final risk severity ranking [Planning]

 PMI®, PMBOK® Guide, 2013, 333

3. b. There is uncertainty in all projects

Every project has uncertainty associated with it because a project by its definition is a temporary endeavor undertaken to create a unique product, service, or result. Risks may be known or unknown. [Planning]

PMI®, PMBOK® Guide, 2013, 3 and 310

4. c. RBS

The risk breakdown structure (RBS) helps to provide framework for ensuring a comprehensive process of systematically identified risks. It is a hierarchically organized depiction of the identified risks by risk categories. [Planning]

PMI®, PMBOK® Guide, 2013, 317, 332

5. d. Brainstorming

Brainstorming is a frequently used information-gathering technique for identifying risk, because it enables the project team to develop a list of potential risks relatively quickly. Project team members, or invited experts, participate in the session. Risks are easily categorized for follow-on analysis. [Planning]

 PMI®, PMBOK® Guide, 2013, 324

7. c. Reduce bias in the analysis and keep any one person from having undue influence on the outcome

The Delphi technique provides a means for arriving at a consensus using a panel of experts to deter­mine a solution to a specific problem. Project risk experts are identified but participate anonymously. Each panelist answers a questionnaire. Then the responses, along with opinions and justifications, are evaluated, and statistical feedback is given to each panel member. The process continues until group responses converge toward a solution. [Planning]

PMI®, PMBOK® Guide, 2013, 324

8. d. Monte Carlo analysis

Simulations are typically performed using Monte Carlo in which a project model is computed many times with the input values chosen at random for each iteration from the probability distribution of these variables. Monte Carlo analysis supports vari­ous statistical distributions (normal, triangular, beta, uniform, etc.) used in estimating budgets, schedules, and resource allocations. [Planning]

PMI®, PMBOK® Guide, 2013, 340

9. c. Schedule network diagram and duration estimates

When determining the likelihood of meeting the project’s schedule end date through Monte Carlo, the schedule network diagram and duration estimate are used as inputs to the simulation program. Cost risk, on the other hand, uses cost estimates from the WBS. [Planning]

PMI®, PMBOK® Guide, 2013, 340

10. a. Use a beta or triangular probability distribution

Interviews often are used to help quantify the prob­ability and consequences of risks on project objec­tives. The type of information collected during the interview depends on the type of probability distri­bution that is used. A beta or triangular distribution is used widely when information is gathered on the optimistic (low), pessimistic (high), and most likely scenarios. [Planning]

PMI®, PMBOK® Guide, 2013, 336–337

11. c. Accepts the consequences of the risk event should it occur

Accepting the consequences of the risk event is categorized as risk acceptance. With this risk response approach, the project team takes no action to reduce the probability of the risk’s occurring. [Planning]

PMI®, PMBOK® Guide, 2013, 344–345

12. d. 56 percent

The likelihood is determined by multiplying the probability of event 1 by the probability of event 2. [Planning]

PMI®, PMBOK® Guide, 2013, 331–332

Wideman 1992, IV-7

13. a. Identifies project assumptions

Project assumptions, which should be enumerated in the project scope statement, are areas of uncertainty, and as such are potential causes of project risk. The scope statement and the WBS are part of the scope baseline, an input to identify risks. [Planning]

PMI®, PMBOK® Guide, 2013, 322

14. c. Watch list

Even low-priority risks must be monitored. A watch list is used to ensure such risks are tracked for con­tinued monitoring. [Planning]

PMI®, PMBOK® Guide, 2013, 347

15. d. Any risks that cannot be known before they occur

There is a category of risks that is sometimes called unknown-unknowns, meaning that the risk is not knowable and, therefore, the probability of the risk is also not knowable. Your lead technical advisor becoming seriously ill, your offices being ransacked by persons engaged in industrial espionage, or one of your subcontractors winning the lottery and run­ning off to the Cayman Islands are all examples of risks that are not known before they occur. However, such risks must be expected and a general contin­gency can be set aside to address the impact they leave in their wake. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 310, 346, 348, and 533

16. b. Sensitivity analysis

Sensitivity analysis, as a quantitative risk analysis and modeling technique, helps to determine the risks that have the most potential impact on the project. It examines the extent to which the uncertainty of each project element affects the objective being examined when all other uncertain elements are held at their baseline values. [Planning]

PMI®, PMBOK® Guide, 2013, 338

17. c. Implementation and closeout

Opportunity and risk generally remain high during the concept and planning phases. However, the amount at stake remains low because of the relatively low level of investment up to that point. During project implementation and closeout, however, risk falls to lower levels as remaining unknowns are translated into knowns. At the same time, the amount at stake rises steadily as the necessary resources are invested to complete the project. [Planning]

PMI®, PMBOK® Guide, 2013, 40

18. c. Active acceptance

Active acceptance means not only accepting the consequences of a risk, but also establishing a plan for dealing with the risk, should it occur. Organizations typically establish a contingency plan funded by a contingency reserve (of time, money, or resources) to handle known, or even some­times potential unknown, threats or opportunities. [Planning]

PMI®, PMBOK® Guide, 2013, 345

19. d. Forecast potential deviation of the project at comple­tion from cost and schedule targets

Earned value is used for monitoring overall project performance against a baseline plan. It is a part of variance analysis, a tool and technique in control risks. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 352

20. b. Assign a relative value to the impact on project objectives if the risk in question occurs

You can develop relative or numeric, well-defined scales using agreed-upon definitions by the stake­holders. When using a numeric scale, each level of impact has a specific number assigned to it. [Planning]

PMI®, PMBOK® Guide, 2013, 331–332

21. b. Product of the probability and impact of the risk

The risk score provides a convenient way to compare risks because comparing impacts or probabilities alone is meaningless. It helps guide risk responses. [Planning]

PMI®, PMBOK® Guide, 2013, 332

22. c. Performing the contingency plan

Corrective action in risk management is the process of making changes to bring expected performance in line with the risk management plan. Such action consists of performing either the planned risk response, such as implementing contingency plans, or a workaround. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 353

23. b. Forces consideration of the probability of each outcome

As a graphical way to bring together information, decision-tree analysis quantifies the likelihood of failure and places a value on each decision. Usually applied to cost and time considerations, this form of risk analysis may be linked to a sensitivity analysis. [Planning]

PMI®, PMBOK® Guide, 2013, 339

Wideman 1992, C-2 and C-3

24. b. Potential risk response

The risk register is prepared first in the identify risks process. It contains a list of identified risks in as much detail as possible and a list of potential responses when they are identifiable at this time. [Planning]

PMI®, PMBOK® Guide, 2013, 327

27. b. Checklists for identify risks

Checklists are a tool and a technique of the identify risks process and include risks encountered on similar, previous projects identified through the lessons learned process and from other sources. The projectteam should review the checklist as part of the identify risks process as well as during closeout. The team should add to the list as necessary, based on its experience, to help others in the future. [Planning]

PMI®, PMBOK® Guide, 2013, 325

**PROCUREMENT**

**1. What doctrine causes a party to relinquish rights under a contract because it knowingly fails to execute those rights?**

a. Assignment of claims

b. Material breach

c. Waiver

d. Warranties

**2. Which term describes those costs in a contract that are associated with two or more projects but are not traceable to either of them individually?**

a. Variable

b. Direct

c. Indirect

d. Semivariable

**3. Contract type selection is dependent on the degree of risk or uncertainty facing the project manager. From the perspective of the buyer, the preferred contract type in a low-risk situation is—**

a. Firm-fixed-price

b. Fixed-price-incentive

c. Cost-plus-fixed fee

d. Cost-plus-a-percentage-of-cost

**4. The buyer has negotiated a cost-plus-incentive fee contract with the seller. The contract has a target cost of $300,000, a target fee of $40,000, a share ratio of 80/20, a maximum fee of $60,000, and a minimum fee of $10,000. If the seller has actual costs of $380,000, how much fee will the buyer pay?**

a. $104,000

b. $56,000

c. $30,000

d. $24,000

**5. Which term describes the failure by either the buyer or the seller to perform part or all of the duties of a contract?**

a. Termination of contract

b. Partial performance

c. Breach of contract

d. Contract waiver

**6. In some cases, contract termination refers to—**

a. Contract closeout by mutual agreement

b. Contract closeout by delivery of goods or services

c. Contract closeout by successful performance

d. Certification of receipt of final payment

**7. Significant differences between the seller’s price and your independent estimate may indicate all the following EXCEPT the—**

a. SOW was not adequate

b. Seller misunderstood the SOW

c. Sellers failed to respond

d. Project team chose the wrong contract type

**8. You are a contractor for a state agency. Your company recently completed a water resource management project for the state and received payment on its final invoice today. A procurement audit has been conducted. Formal notification that the contract has been closed should be provided to your company by the—**

a. State’s project manager

b. Person responsible for procurement administration

c. Project control officer

d. Project sponsor or owner

**9. Which term describes contract costs that are traceable to or caused by a specific project work effort?**

a. Variable

b. Fixed

c. Indirect

d. Direct

**10. When a seller breaches a contract, the buyer cannot receive—**

a. Compensatory damages

b. Punitive damages

c. Liquidated damages

d. Consequential damages

**11. Which term is NOT a common name for a procurement document that solicits an offer from prospective sellers?**

a. Contractor initial response

b. Request for information

c. Request for quotation

d. Invitation for negotiation

12. **Because you are working under a firm-fixed-price contract, management wants you to submit the final invoice and close out the contract as soon as possible. Before final payment on the contract can be authorized, you must—**

a. Prepare a contract completion statement

b. Audit the procurement process

c. Update and archive contract records

d. Settle subcontracts

**13. Recent data indicate that more than 10,000 airline pas­sengers are injured each year from baggage that falls from overhead bins. You performed a make-or-buy analysis and decided to outsource an improved bin design and manufacture. The project team needs to develop a list of qualified sources. As a general rule, which method would the project team find especially helpful?**

a. Advertising

b. Internet

c. Trade catalogs

d. Relevant local associations

**14. As you prepare to close out contracts on your project, you should review all the following types of documentation EXCEPT the—**

a. Contract document for the contract being closed

b. Procurement audit report

c. Invoice and payment records

d. Seller performance reports

**15. You are working on a new project in your organization. You need to decide how best to staff the project and handle all its resource requirements. Your first step should be to—**

a. Conduct a make-or-buy analysis

b. Conduct a market survey

c. Solicit proposals from sellers using an RFP to deter­mine whether you should outsource the project

d. Review your procurement department’s qualified-seller lists and send an RFP to selected sellers

**16. Your company decided to award a contract for project management services on a pharmaceutical research project. Because your company is new to project manage­ment and does not understand the full scope of services that may be needed under the contract, it is most appro­priate to award a—**

a. Firm-fixed-price contract

b. Fixed-price-incentive contract

c. Cost-plus-a-percentage-of-cost contract

d. Time-and-materials contract

**17. Requirements for formal contract acceptance and closure usually are defined in the—**

a. Proposal

b. Statement of work

c. Contract terms and conditions

d. Procurement audit report

**18. You plan to award a contract to provide project manage­ment training for your company. You decide it is impor­tant that any prospective contractor have an association with a major university that awards master’s certificates in project management. This is an example of—**

a. Setting up an independent evaluation

b. Preparing requirements for your statement of work

c. Establishing a weighting system

d. Establishing source selection criteria

**19. All the following elements must be evident in a written contract for it to be legally enforceable EXCEPT—**

a. Legal capacity

b. Mutual assent

c. Appropriate form

d. Pricing structure

**20. A purchase order is a good example of which form of contracting?**

a. Unilateral

b. Bilateral

c. Trilateral

d. Severable

**21. You are responsible for ensuring that your seller’s performance meets contractual requirements. For effective contract control, you should—**

a. Hold a bidders’ conference

b. Establish the appropriate contract type

c. Implement the contract change control system

d. Develop a statement of work

**22. The primary benefit of contract control procurements is to ensure that—**

a. Buyers conduct performance reviews

b. Payment is made in a timely fashion

c. Disagreements are handled quickly and to every­one’s satisfaction

d. Both parties meet contractual obligations and protect their legal rights

**23. Buyers use a variety of methods to provide incentives to a seller to complete work early or within certain contrac­tually specified time frames. One such incentive is the use of liquidated damages. From the seller’s perspective, liquidated damages are what form of incentive?**

a. Positive

b. Negative

c. Nominal

d. Risk-prone

**24. The principal function of a warranty is to—**

a. Provide assurance of the level of quality to be provided

b. Provide a way to assert claims for late payment

c. Provide a way to allow additional time following accep­tance to correct deficiencies, without additional costs

d. Ensure that goods purchased fit the purposes for which they are to be used

**25. You have decided to award a contract to a seller that has provided quality services to your company frequently in the past. Your current project, although somewhat differ­ent from previous projects, is similar to other work the seller has performed. In this situation, to minimize your risk you should award what type of contract?**

a. Fixed price with economic price adjustment

b. Fixed-price-incentive (firm target)

c. Firm-fixed-price

d. Cost-plus-award-fee

**Answer Key (Procurement)**

1. c. Waiver

Under the doctrine of waiver, a party can relinquish rights that it otherwise has under the contract. If the seller offers incomplete, defective, or late perfor­mance, and the buyer’s project manager knowingly accepts that performance, the buyer has waived its right to strict performance. In some circumstances, the party at fault may remain liable for provable damages, but the waiver will prevent the buyer from claiming a material breach and, thus, from terminat­ing the contract. [Executing]

2. c. Indirect

The nature of an indirect cost is such that it is neither possible nor practical to measure how much of the cost is attributable to a single project. These costs are allocated to the project by the performing organiza­tion as a cost of doing business. [Planning]

PMI®, PMBOK® Guide, 2013, 202, 365

3. a. Firm-fixed-price

Buyers prefer the firm-fixed-price contract because it places more risk on the seller. Although the seller bears the greatest degree of risk, it also has the maximum potential for profit. Because the seller receives an agreed-upon amount regardless of its costs, it is motivated to decrease costs by efficient production. [Planning]

 PMI®, PMBOK® Guide, 2013, 363

4. d. $24,000

Comparing actual costs with the target cost shows an $80,000 overrun. The overrun is shared 80/20 (with the buyer’s share always listed first). In this case 20% of $80,000 is $16,000, the seller’s share, which is deducted from the $40,000 target fee. The remaining $24,000 is the fee paid to the seller. [Planning and Closing]

 PMBOK® Guide, 2013, 364

5. c. Breach of contract

A breach of contract is a failure to perform either express or implied duties of the contract. Either the buyer or the seller can be responsible for a breach of contract. [Executing]

6. a. Contract closeout by mutual agreement

A contract can end in successful performance, mutual agreement, or breach of contract. Contract closeout by mutual agreement or breach of contract is called contract termination. [Closing]

PMBOK® Guide, 2013, 387

7. d. Project team chose the wrong contract type

The contract type is typically dictated by the pro­curement SOW and chosen by the contracting officer. Independent estimates are a tool and technique in conduct procurements. [Executing]

 PMI®, PMBOK® Guide, 2013, 376

8. b. Person responsible for procurement administration

The person responsible for procurement administra­tion should provide, in writing, formal notification that the contract has been completed. Requirements for formal acceptance and closeout should be defined in the contract. [Closing]

PMI®, PMBOK® Guide, 2013, 389

9. d. Direct

Direct costs are always identified with the cost objectives of a specific project and include salaries, travel and living expenses, and supplies in direct support of the project. [Planning]

PMI®, PMBOK® Guide, 2013, 202, 207, and 365

10. b. Punitive damages

Punitive damages are designed to punish a guilty party and, as such, are considered penalties. Because a breach of contract is not unlawful, punitive damages are not awarded. The other remedies listed are available to compensate the buyer’s loss. [Closing]

Ward 2008, 357

11. b. Request for information

Procurement documents are used to solicit proposals from prospective sellers. A request for information is generally used by the buyer to have potential sellers propose various pieces of information related to a prod­uct, service, or result or to a seller capability. [Planning]

 PMI®, PMBOK® Guide, 2013, 368

12. d. Settle subcontracts

All payments due must be settled by the seller before the contract can be officially closed. The other items listed are activities performed by the buyer. [Closing]

Garrett 2007, 128–133

13. a. Advertising

Advertising in newspapers or specialty trade publica­tions is an excellent way to identify qualified bidders. Detailed information about specific sources may require more extensive effort, such as site visits or contact with previous customers. [Executing]

PMI®, PMBOK® Guide, 2013, 376

14. b. Procurement audit report

In most organizations, a procurement audit is con­ducted after the contract has been closed. Therefore, the project manager would not have a procurement audit report to review. Contract document for the contract being closed, invoice and payment records, and seller performance reports are examples of the documents that should be available to the project manager and should be reviewed at closeout. [Closing]

 PMI®, PMBOK® Guide, 2013, 388–389

15. a. Conduct a make-or-buy analysis

A make-or-buy analysis is a plan procurement man­agement tool and technique used to determine whether a particular product, service, or result can be produced or performed cost effectively by the performing organization or should be contracted out to another organization. The analysis includes both direct and indirect costs and any administrative costs incurred to manage the contractor. [Planning]

PMI®, PMBOK® Guide, 2013, 365

16. d. Time-and-materials contract

A time-and-materials contract is a type of contract that provides for the acquisition of supplies or services on the basis of direct labor hours, at specified fixed hourly rates for wages, overhead, general and admin­istrative expenses, and profit; and materials at cost, including materials-handling costs. [Planning]

PMI®, PMBOK® Guide, 2013, 364

17. c. Contract terms and conditions

The contract terms and conditions typically describe the procedure the buyer will employ to close the contract. [Closing]

PMI®, PMBOK® Guide, 2013, 377–378, 387

18. d. Establishing source selection criteria

The selection criteria are typically included in procurement documents and are then used to rate or score proposals. [Planning]

 PMI®, PMBOK® Guide, 2013, 368–369

19. d. Pricing structure

The following elements must be present for a con­tract to be legally enforceable: legal capacity, mutual assent, consideration, legality, and an appropriate contract form that follows applicable laws governing businesses. [Executing]

Adams et al. 1997, 240

20. a. Unilateral

The purchase order is a unilateral (one signature) offer that includes a promise to pay upon delivery. [Planning]

21. c. Implement the contract change control system

Contract change control entails ensuring that contract changes are properly approved and that everyone who needs to know is made aware of such changes. [Monitoring and Controlling]

PMI®, PMBOK® Guide, 2013, 383

22. d. Both parties meet contractual obligations and protect their legal rights

Contracts are awarded to obtain goods and services in accordance with the buyer’s stated requirements. Although there are multiple purposes in the control procurements process, ensuring that the seller delivers what is stated in the contract is of paramount importance. [Monitoring and Controlling]

 PMI®, PMBOK® Guide, 2013, 379

23. b. Negative

Liquidated damages are considered negative incentives because they result in a loss of revenue for the seller if it fails to perform rather than a gain in revenue if it performs well. [Closing]

Kerzner, 2009, 849

24. a. Provide assurance of the level of quality to be provided

A warranty is one party’s assurance to the other that goods will meet certain standards of quality, including condition, reliability, description, function, or performance. This assurance may be express or implied. [Executing]

PMI®, PMBOK® Guide, 2013, 369

25. c. Firm-fixed-price

In a firm-fixed-price contract, the seller receives a fixed sum of money for the work performed regard­less of costs. This arrangement places the greatest financial risk on the seller and encourages it to control costs. [Planning]

 PMI®, PMBOK® Guide, 2013, 363

**Good Luck**