Project Management eWorkbook 5th Edition Chapter Answers with Explanations

Chapter 1 Overview - Answers w/explanations

1. **Ans. a - Defines a prescribed methodology for managing a project**

The PMBOK® Guide provides knowledge and is not a methodology. In fact, it takes great care not to specify a specific methodology by stressing the importance of selecting and tailoring the processes to fit the individual project situations. Even the ANSI "Standard for Project Management" does not require any specific process to be used and provides for tailoring individual processes.

2. **Ans. d – All of these**

All of the statements are true for Stakeholders. Stakeholders impact both project execution and completion. Stakeholders influence project outcomes, but the level of influence varies over the project timeline.

3. **Ans. c – Functional Manager**

While some functional managers may be providing resources to the project, the functional manager could be in a function with different priorities and not involved in supporting the project. The other roles are all critical to the project and represent true stakeholders.

4. **Ans. c - Create a risk register for the project**

While the executive may certainly review the risk register, the creation of the risk register is the responsibility of the project manager and/or the project team.

5. **Ans. c - Person accountable for enabling project success**

The project sponsor is accountable for enabling project success by providing resources and support to the project. The sponsor is a primary link between the project manager and the executive staff. The project manager is often a direct report to the sponsor.

6. **Ans. b - The project meets or exceeds the expectations of the stakeholders**

Stakeholder satisfaction is the critical factor in determining a successful project.

7. **Ans. d - On Going Operations**

A minor change was requested in the current production report indicating that this is part of the ongoing operations. The production report is not a unique product. Projects are unique with defined start and end dates.

8. **Ans. b – Progressive Elaboration**

Progressive elaboration is carried out incrementally over time as additional information becomes available in determining the features and characteristics of a new product.

9. Ans. a - Develop Charter, Manage Project Knowledge, Perform Integrated Change Control

Executing and initiating are process groups and are not one of the 49 processes. The business case is developed prior to start of the project. Developing Charter, Managing Project Knowledge, Performing Integrated Change Control are three of the seven processes that make up the Integration Knowledge Area.

10. Ans. d – Schedule Management and Planning

Initiation is not a knowledge area, schedule management is not a process group, and the processes mentioned are part of the Schedule Management Knowledge Area within the Planning Process Group. Note that knowledge area names are nouns and process group names are verbs.

11. Ans. b – Planning process group and scope, schedule, and cost mgmt. knowledge areas

All three processes are part of the Planning Process Group. Collecting requirements is part of scope management, estimating times is part of schedule management, and estimating costs is part of cost management.

12. Ans. a - Portfolio, program, project, work package, task

Portfolio comprises all project work. Programs exist within the portfolio or other programs. Projects exist within the portfolio and/or programs. Work Package is the smallest division of work within the project work breakdown structure and tasks exist within the work package.

13. Ans. b - Ensures projects and critical resources are properly selected and allocated

See Organizational Project Management (OPM) on page 17 of PMBOK® Guide 6th edition.

14. Ans. c - Program management coordinates resources and interfaces between projects

Portfolio also includes the operations assets. Projects, programs, portfolios, and operations share stakeholders. Projects are not repetitive since each project is unique.

15. Ans. a - Initial, Intermediate, Final, Initial

Stakeholder influence and risk are greatest at start of the project, staffing peaks out in the intermediate phases, and cost of changes are highest at end of the project.

16. Ans. c - The product's life cycle depends on the project life cycle that created it

The project life cycle is the framework for managing a project. The project life cycle and product life cycle are independent of each other.

17. Ans.: a - The level of risk is highest at the beginning of a project when least amount of information is available

Risk is highest at the beginning of the project and decreases over the project life cycle while the number of unknowns and chance of risk occurrences decrease.

18. Ans. C – Site Y

Multiplying the weighting coefficient times each factor score, then adding the results for each site yields the following values: W=67, X=75, Y=80, Z=70. Site Y price factor is not the highest (Lowest cost), but it scores highest with the multi-criteria and should be selected.

19. Ans. d – All of these

Tailoring involves making selections regarding all the project elements to fit the project and environment. All the elements listed are selected as appropriate to tailor a project.

20. Ans. d – Incremental

In predictive scope, time, and cost are determined in the early phases. Hybrid is a mixture of predictive and adaptive life cycles. Adaptive is the change driven group of life cycles consisting of iterative, incremental, and agile. Within that group, incremental successively adds functionality in a specified time frame.

21. Ans. b – 3.0 Years

Total cost $75M. Subtracting $15M return in first year reduces balance to $60M. Dividing balance by $7.5 per quarter equals 8 quarters or 2 years yielding a three-year payback.

22. Ans. c - New Plant because the IRR is larger

When selecting projects purely on financial criteria pick the project with the highest IRR because it represents the highest rate of return for the company.

23. Ans. c - New plant because the NPV is zero.

A zero NPV means that the project met the company's discount rate target and will generate a positive return. A negative NPV does not meet the discount rate and even though the payback is shorter when funds are discounted the cashflow is negative.

Chapter 2 Answers with Explanations

1. **Ans. a - Project Objective**

The purpose of the team charter is to define and regulate the behavior of the team. The project objective is part of the Project Charter which authorizes the start of the project

2. **Ans. b - Developing career paths and pay recommendations**

Career paths and pay recommendations would relate to direct reports of which most project managers have very few. The project manager's team typically consists of people other than direct reports that are temporarily assigned or contracted to the project. Career path development is extremely difficult in a project environment which is defined as temporary.

3. **Ans. b - Creating the project business case and securing funding**

Typically, the business case is developed as part of the project selection process and funding is secured before the project can begin.

4. **Ans. d – All of the above**

All items described help to build trust, respect and understanding as was done in the personal history exercise. The personal history exercise is not unique and other properly structured ice breaking activities can accomplish these objectives.

5. **Ans.: b - They should explain their companies' rules, standards, and business philosophies**

The first meeting particularly with spouses should concentrate on building relationships without getting into company rules, standards, etc.

6. **Ans. c - Projectized organization**

A projectized organization gives the project manager the greatest authority with an infrastructure that supports project managers, typically maximizes the number of direct reports, and documents project managers authority to make project decisions.

7. **Ans. d – None of these**

All the advantages listed are typical of a functional organization and conversely are disadvantages of

8. **Ans. b - Strong Matrix**

Employees in matrix organizations report to two or more bosses and the reporting relationship of Diane to Victor Clark VP of Operations makes it a strong matrix organization.

9. **Ans. c – Projectized**

Projectized organizations frequently employ contractors dedicated to the project to get the skills needed for the project for a set time and then released. This also avoids the issue of reassigning manpower and overhead issues of personnel not employed on a project.

10. Ans. c – History and lessons learned from the Savannah project

History and lessons learned from the Savannah project could identify opportunities to exploit and threats to avoid in the Bakersfield project as well as aiding in identifying constraints and assumptions. In planning it could help in creating WBS, time estimates, construction templates, etc. Due to the similarities of the two projects, properly documented historical data and lessons learned could help either directly or as thought starters in almost every area of the Bakersfield project.

11. Ans. a - Enterprise Environmental Factors, Organizational Process Assts, Business Documents

Develop the project charter and stakeholder identification are the two processes within the Initiating Process group. EEF and OPA are common inputs to almost all processes including these two, and the business documents are common inputs to both. Developing the Project Charter is a process within the initiating process group and cannot be an input to itself. The Project Management Plan is created after the project charter and is not an input to stakeholder identification.

12. Ans.: a - Tool used in the Schedule Management Knowledge Area

The RAM is a subset of the Data Representation Tools used in the Resource Management Knowledge Area to Plan Resource Management. The other three statements are correct.

13. Ans.: c. – RAM

RAM is the responsibility assignment matrix used to align activities with responsibilities. The other three are various forms of network diagramming. PDM is Precedence Diagramming Method also known as AON the Activity On Node. The AOA is Activity On Arrow which is another valid diagramming method which is not covered in the PMBOK Guide since the 4th edition.

Chapter 3 Communications – Answers with Explanations

1. **Ans. c – 45**

Counting project managers, there are 10 on the joint engineering team. The equation is $[(n(n-1)]/2$. Substituting 10 for n in the equation yields $[10(10-1)]/2 = 90/2 = 45$

2. **Ans.: d – All of These**

Data gathering is widely used and utilized in all the processes listed.

3. **Ans.: c – Brainstorming**

Brainstorming is a widely used technique for creating a large list of ideas quickly. The Delphi technique involves multiple rounds and the Nominal Group technique involves voting which helps in organizing and prioritizing but takes longer. The affinity diagram does not generate ideas but does organize the brainstorming information.

4. **Ans. b: Identifies the project's high risks**

High risks to the project are normally identified in the Project Charter. Business needs are part business case within the business documents which are input to developing the project charter. The quality plan is part of the project management plan that is developed after the project charter. Team members are not identified until after the project manager has begun the project planning.

5. **Ans.: b - The formal contract used to initiate the project**

The Project Charter is not a formal contract since no money is promised or exchanged. It is simply a document that authorizes the start of the project and gives the project manager authority to begin committing resources.

6. **Ans.: b - It acknowledges the existence of the project and authorizes commitment of organizational resources to the project**

While the project sponsor may develop and/or approve the project charter, the charter's purpose is not to recognize or acknowledge the sponsor. The charter does not identify the project team or describe the selection process used to authorize the project. The charter purpose is to formalize the project and authorize resource commitments.

7. **Ans. a - Collect Requirements, Develop WBS, Control Scope**

Collect Requirements, Develop WBS, Control Scope are three of the six processes in the Scope Management Knowledge Area. Manage scope changes is not among the 49 processes specified by PMI and Define Activities is part of Schedule Management.

8. **Ans. c – Define Scope**

While all four items are processes within the scope management knowledge area, the scope statement is an output of the Define Scope process. Collect Requirements is a predecessor and Create WBS is a successor to Define Scope.

9. Ans. c – Collect Requirements

Data Analysis is used in 18 of the 24 planning processes including collecting requirements. Context Diagrams and Prototypes are unique to the collecting requirements process.

10. Ans.: a - Body language from a speaker and feedback from the listeners is critical.

Body language is a critical communication tool from both speakers and listeners since most communication is none verbal. Documents with more detail are longer and read by fewer people. Verbal communications frequently require some form of written or verbal follow up. The receiver is responsible for ensuring a message is understood.

11. Ans.: a - Interpersonal and team skills, Meetings, PMIS

Expert Judgement only applies to monitoring communications, while communication methods and project reporting are tools for communication management.

12. Ans.: d - All of these

All these statements are true. Communication plan also ensure the right message.

13. Ans.: b - Time and Material

Field orders involving changes requiring immediate action typically use Time and Material contracts. These contracts generally include a percentage of the actual costs agreed to when the original firm fixed price building contract was issued to cover the contractor's overhead and administrative costs.

14. Ans.: d – All of these

All three listed are cost reimbursable. The difference between them is in how the fee is determined by fixed amount, incentive formula, or award formula. The degree to which risk is shared between buyer and seller determines the type of contract. In cost reimbursable contracts the buyer carries all the risk.

15. Ans.: a - Standard items or clearly defined projects

The degree to which risk is shared between buyer and seller determines the type of contract. Firm Fixed Price places all the risk on the seller and consequently requires a very clear understanding of requirements with very little variation expected.

16. Ans.: b - Conduct Procurements

Select Sellers and Contract Administration are not among the 49 PMBOK Guide processes.

17. Ans.: d - Selected sellers and agreements

Seller selection and agreements are part of the conduct procurements process. All other items are part of the procurement plan.

18. Ans.: c - G. Krebs, BCI Building Materials buyer

Since the building steel is being purchased under contract the PMBOK Guide requires the buyer prepare the SOW. The buyer will be assisted by others as appropriate.

Chapter 4 Coordination - Answers with Explanations

1. **Ans.: d – All of these.**

The stakeholder register is the prime output and includes identification, assessment and classification information. In addition, the output includes updates to project documents and the project management plan. The issue log, assumption log, and risk register are project documents typically updated. The risk management and requirements management plans are part of the project management plan.

2. **Ans.: b - All work packages must roll up to the higher levels leaving nothing out**

The 100% Rule in WBS refers to everything rolling up to higher levels which ensures the network logic is correct without any stragglers. See page 161 PMBOK Guide.

3. **Ans.: c - Contains the detailed product description**

The scope baseline is an output of the create WBS process focused on the project description not the product. Thus, everything is presented in terms of the project with the WBS, WBS dictionary, and work packages identifying all activities. It also includes the project scope statement and sometimes includes planning packages which are smaller WBS between control accounts and the work packages.

4. **Ans.: c - Creating the WBS is a process within the schedule management knowledge area**

Creating the WBS is a process within the Scope Management knowledge area and the Planning Process Group. The WBS is a part of the scope baseline output.

5. **Ans.: a - Use the Savannah Project WBS as a template WBS for the Bakersfield project**

The SWOT analysis, cost estimates, and cost benefit analysis were all based on a time more than two years ago, in a location of the country far from the California labor and economic environment. These differences along with the current market conditions would make the effort to translate these items into the Bakersfield project non-value added. However, the WBS would be a great template due the similarity of the projects and obvious parallels in activities to build another plant. Many other details of the Savannah project could aid directly or provide thought starters for the Bakersfield project.

6. **Ans.: a. – Finish to Start**

The Finish to Start is the most common relationship found in most networks.

7. **Ans.: c - Every activity has one or more predecessors and successors**

The statement that "Every activity has one or more predecessors and successors" is false, since the first activities have no predecessors and the last activities have no successors.

8. Ans.: b - Discretionary Logic

An equipment runoff at the vendor is not mandatory (hard logic) but is considered a best practice particularly when new technology first of a kind process is involved. While this might be considered internal logic under the team's control, the fact that it is a best practice and the desired sequence makes discretionary logic the best answer.

9. Ans.: b

A and B have no predecessors to begin the network. C depends on A and B, while D depends on C and E depends on B. D and E have no successors to complete the network.

10. Ans.: b – Lead Lags

Lead Lags, PDM, PMIS, and dependency determination are the tools used for sequencing activities. Decomposition is used in defining activities, expert judgement is used in estimating activity durations, and critical path is used to develop the schedule.

11. ANS.; c – Always specified by the customer

While customers may specify certain milestones particularly via the contract, milestones may also be specified by project leadership, project managers, or the project team and can be optional. Milestones are a specific point in time and thus have zero duration

12. Ans. a - Define Activities, Sequence Activities, Estimate Activity durations

Define Activities, Sequence Activities, Estimate Activity durations are three of the six processes within the Schedule Management Knowledge area. Estimating activity costs and resources are not processes within the Schedule Management area. Submitting schedule updates is an output not a process.

13. Ans.: a – Analogous

Analogous is a gross estimate considering similar projects and adjusting as needed. Parametric calculates specific parameters. PERT and Three Point use three estimates.

14. Ans.: c – Three Point Estimate

The Three Point Estimate uses the most likely, optimistic, and pessimistic estimates averaged together to get the expected duration which is referred to as a triangular distribution.

15. Ans.: b - Estimate completion is fast at low cost

Bottom up estimating due to the number of people involved takes more time and costs more.

16. Ans.: a - Expected time 5.5 weeks, Range of Uncertainty 5 weeks

Equation for expected time $= t_e = (t_o + 4t_m + t_p)/6 = (4 + (4\times5) + 9)/6 = 5.5$ weeks
Equation for Uncertainty Range $= t_p – t_o = 9 – 4 = 5$ weeks

17. Ans.: d - Expected time 6 weeks, Range of Uncertainty 5 weeks

Equation for expected time $= t_e = (t_o + t_m + t_p)/3 = (4 + 5 + 9)/3 = 6$ weeks
Equation for Uncertainty Range $= t_p – t_o = 9 – 4 = 5$ weeks

18. Ans.: b – Parametric

Parametric estimates are based on standard costs or time/unit multiplied by the number of units to determine a cost or time duration. Analogous is more of a gross estimate based on prior similar projects. Both Three Point and PERT involve three estimates from which an expected value is determined.

19. Ans.: d – PERT

PERT is a well-known estimating technique using a beta distribution to determine expected duration and range of uncertainty. It is no longer listed as an estimating tool in the 6th edition of the PMBOK guide.

20. Ans. b – Activity Prioritization

Activity prioritization is not a scheduling technique, but the other items are valid techniques. Resource optimization involves leveling the resources to fit their availability. Application of fast tracking and crashing are schedule compression techniques which involve overlapping activities normally done in sequence or adding resources to shorten activity times. Lead lags involve adjusting the start time of successor activities to advance or delay the activity.

21. Ans. d – Expert Judgement

While Expert Judgement is used in many processes and is inherent in a lot of the data gathered for schedule development, it is not considered a tool for this process. Basically, this process is more directed at manipulating the data to achieve an approved schedule rather than generating additional data that might involve expert judgement. The other three items listed are all tools and techniques used in the develop schedule process.

22. Ans. d – Schedule Forecast

The schedule forecast is not an output of develop schedule, rather it is an output of control schedule.

23. Ans. d - Summary chart compiles all details from the Network, Gantt, and Milestone charts

Summary chart rolls up info from the Gantt chart to a higher level with less detail for upper management reviews to allow focusing on the project big picture issues.

24. Ans. b – Resource Smoothing

Resource loading involves adding resources into the project. Resource leveling lowers peak resource values to a specified level that usually extends the project completion date. Resource balancing is not a term used when reducing resource peaks. Resource smoothing is a special case of leveling that does not allow extending the project date.

25. Ans. d – All of These

To reach the specified level usually requires extending the project completion date. In addition, it generally changes the critical path and may introduce more critical paths into the project.

26. Ans.: b – Parametric

Parametric estimates are based on standard costs or time/unit multiplied by the number of units to determine a cost or time duration. Analogous is more of a gross estimate based on prior similar projects. Both Three Point and PERT involve three estimates from which an expected value is determined.

27. Ans.: d – PERT

PERT is a well-known estimating technique using a beta distribution to determine expected cost and range of uncertainty. It is no longer listed as an estimating tool in the 6th edition of the PMBOK guide.

28. Ans.: c – Three Point Estimate

The Three Point Estimate uses the most likely, optimistic, and pessimistic estimates averaged together to get the expected cost which is referred to as a triangular distribution.

29. Ans.: a – Analogous

Analogous is a gross estimate used to get a quick although least accurate estimate. It is generally done when developing strategic plans or in the very early stages of a project.

30. Ans. c – Change Requests

While change requests are common outputs from many processes, it is not an output of the determine budget process. Determine budget sets the cost baseline and funding requirements as well as updating various project documents.

31. Ans. b – Cost Management, Planning, Determine Budget

All the tools and techniques described are part of the Determine Budget process which is in the planning process group and the Cost Management knowledge area. Develop budget, Estimate Budget, and Control Budget are not part of the 49 processes.

32. Ans. d – Work Performance Data

The work performance data is not generated until after estimating is complete and work has started thus it is not an input. The scope baseline is a subset of the Project Management Plan, the risk register is a subset of the Project Documents, and the published estimating data is part of the organization's Enterprise Environmental Factors which are all inputs to estimating activity resources.

33. Ans. d – All of these

All these factors should be considered. However, some may have more weight than others depending on the project situation. Use of a properly weighted multi-criteria decision process should help in making the best selections for the project.

34. Ans. d – Expert Judgement

Expert Judgement is not identified as a tool when acquiring resources in the PMBOK Guide. There are four tools identified: decision making, virtual teams, pre assignment, and interpersonal and team skills. Negotiation is part of the interpersonal and team skills. Multi-criteria decisions are part of decision making.

35. Ans. c - Forming, Storming, Norming, Performing, Adjourning

Communicating and collaborating are not one of the five stages. Initiating, Planning, Executing, Monitoring and Controlling, and Closing are the five process groups. Storming occurs before norming in the Tuchman Ladder.

36. Ans. d – All of These

Interpersonal and team skills are key to effective project management and critical skills needed to acquire, manage, and control resources when executing and controlling the project.

37. Ans. b - Team Charter and Personal History

The team charter sets the environment and the personal history builds relationships. The Project Charter is used to communicate the mission and goals and the team norms are part of the team charter. The Organizational charts and RASIC charts are for role clarification.

38. Ans. c – Norming

Norming is indicative of a team with minimal conflict working together in a positive environment respectful of each other. In the forming stage team members are just learning about the project and their roles. Smoothing and Collaborating are conflict resolution techniques.

Chapter 5 Control - Answers with explanations

1. Ans.: D – All of These

Cost Time, and Scope are the triple constraints. A positive change in any one of these has the potential to cause negative changes in the other two. For example, reducing the cost which is a positive change for the project may result in increased time or reduced scope which are negative changes for the project.

2. Ans.: A - Activities with negative float that are near term with long durations

When correcting time variations only activities on the critical path (negative float) yield improvements. The longest durations provide the most opportunity to reduce cost. The nearest must be addressed first, since waiting will cause those opportunities to be lost as the project timeline progresses.

3. Ans.: D – All of These

The critical path determines the early and late start and finish of all activities, it is the longest path in the network, and establishes the minimum project duration.

4. Ans.: D – All of These

Free float avoids any impact on successive activities, while total float avoids any impact on the project completion date.

5. Ans.: C - Negative float occurs when the late start is sooner than the early start

A project may have multiple critical paths with the same duration. Total float relates to the total project not successive activities. Any time the late start or finish is smaller than the early start or finish the float is negative. Float = LS-ES or Float = LF-EF

6. Ans.: A - Critical Path ACHI, Duration 11

Normal process is to conduct a forward and reverse pass to establish the critical path and project duration. For small networks with only a few paths, simply determine the duration **of** every path and select the path with the longest duration.

7. Ans.: B Critical Path ABGI, Duration 12

Normal process is to conduct a forward and reverse pass to establish the critical path and project duration. For small networks with only a few paths, simply determine the duration of every path and select the path with the longest duration.

8. Ans.: C - Critical Path BDF, Duration 11

Normal process is to conduct a forward and reverse pass to establish the critical path and project duration. For small networks with only a few paths, simply determine the duration of every path and select the path with the longest duration.

9. Ans.: B - Critical Path BDEG, Duration 16

Normal process is to conduct a forward and reverse pass to establish the critical path and project duration. For small networks with only a few paths, simply determine the duration of every path and select the path with the longest duration.

10. Ans.: C - Number of Paths = 9, Number of Critical Paths = 2, Duration 12

Normal process is to conduct a forward and reverse pass to establish the critical path and project duration. Take care to identify all nine paths (ABEFI, ABEGI, ABEHI, ACEFI, ACEGI, ACEHI, ADEFI, ADEGI, ADEHI) and recognize there is more than one critical path. (ABEFI, ABEHI).

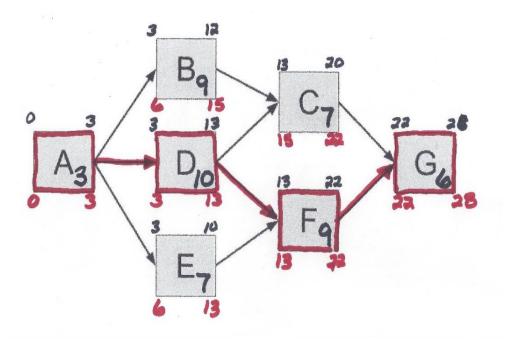### 11. Ans.: A - Planned = 8 days, Forecasted = 10 days, it is behind schedule

When remaining work is zero the planned completion is 8 days. The forecast is 10 days. When forecast completion (dash line) is after the planned the project is behind schedule.

12. Ans.: A - Planned = 8 days, Forecasted = 6 days, it is ahead of schedule

When remaining work is zero the planned completion is 8 days. The forecast is 6 days. When forecast completion is ahead of (earlier) planned the project is ahead of schedule.
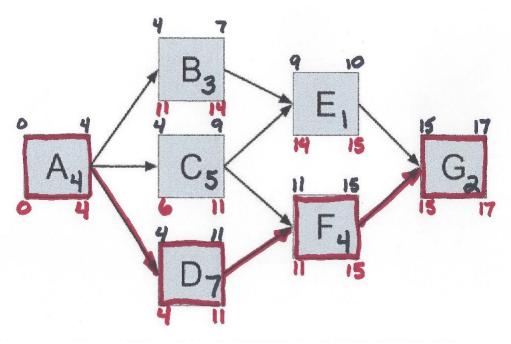
13. Ans. B Critical Path ADFG, Latest start for C is15

Forward pass yields early start and finish dates in black at top of each box and reverse pass yields late start and finish dates shown in red at bottom of each box in the following diagram. Critical path is shown in red on activities with zero float ADFG and the late start for C is 15.
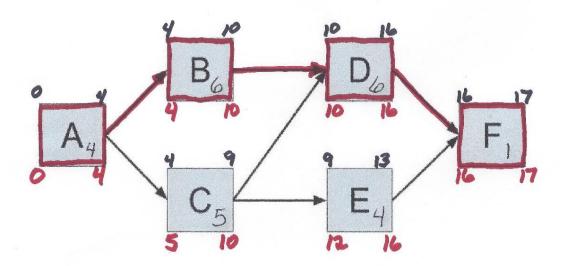
14. Ans.: D - Critical Path ADFG, Latest finish for B is 14

Forward pass yields early start and finish dates in black at top of each box and reverse pass yields late start and finish dates shown in red at bottom of each box in the following diagram. Critical path is shown in red on activities with zero float ADFG and the late finish for B is 14.
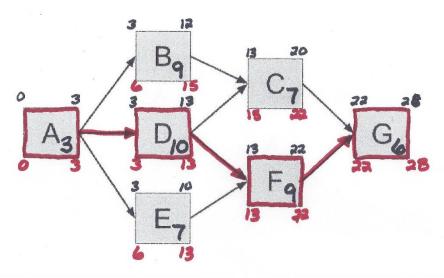

15. Ans.: A - Critical Path ABDF, Float Activity B = 0, Float Activity C = 1

Forward pass yields early start and finish dates in black at top of each box and reverse pass yields late start and finish dates shown in red at bottom of each box in the following diagram. Critical path is shown in red on activities with zero float ABDF, B float is 0, and C float is 1.

16. Ans.: A.- Project completion 28 days, Impact of E starting day 5 is none

Forward pass yields early start and finish dates in black at top of each box and reverse pass yields late start and finish dates shown in red at bottom of each box in the following diagram. Earliest project completion is 28 days. Activity E has a 3 day float, so delaying the start by 2 days does not have any impact on project completion.

17. Ans. C – Fast Tracking

Fast tracking involves overlapping tasks or phases that were originally sequential to reduce the time needed to complete a project without changing the individual task times.

18. Ans. B – Crashing

Crashing involves adding resources (manpower, money, equipment, etc.) to reduce the time required to complete a task. It is important to only apply it to critical path items, check for changes in critical path, and select the items that give the greatest benefit for the least cost.

19. Ans.: B - Crash G for 2 days, then crash C for 2 days, then crash D for 1 day, added cost $350

The first step is to determine the critical path (ACEG). Then determine the incremental crash cost/day for the critical path activities (A=300, C=100, E=150, G=50). Since G is least cost take 2 days out of G at a cost of $100. Next lowest cost is C, so two days are removed at a cost of $200. A check of the critical path indicates the new critical path BDEG is still one day too long so one day is removed from D at a cost of $50. Final answer crash G 2 days, crash C 2 days, crash D 1 day at a total added cost of $350

20. Ans.: A - CV=-$8K, CPI=0.67, SPI=0.80, over budget and behind schedule

From the chart PV= $20K, EV= $16K, AC= $24K.
Cost Variance (CV) = EV – AC = 16 – 24 = -$8K
CPI = EV/AC = 16/24 = 0.67, SPI = EV/PV = 16/20 = 0.80
Since both CPI and SPI are less than 1.0, the project is over budget and behind schedule.

21. Ans.: C - SV=+10 Man-days, CPI=1.50, SPI=1.20, under budget and ahead of schedule

SV = EV-PV = 60 – 50 =10 Man-days. CPI = EV/AC = 60/40 = 1.5. SPI= EV/PV = 60/50 = 1.2 When CPI and SPI are greater than 1 the project is under budget and ahead of schedule.

22. Ans.: A - CV= -$150, over budget

Adding the task earned values yields PV = 800, EV = 500, and AC = 650 for the total project. The cost variance is EV-AC = 500-650 = -$150 Since EV is less than the AC, it is over budget.

23. Ans.: A - Over budget, behind schedule, TCPI = 2.0

Adding the task earned values yields PV = 800, EV = 500, and AC = 650 for the total project. Since EV is less than PV it is behind schedule. The total planned value for all tasks (PV=800) is the Budget at Completion (BAC)
TCPI = (BAC-EV)/(BAC-AC) = (800-500)/(800-650) = 300/150 = 2.0

24. Ans.: A - CV= 0, CPI= 1.0, SPI = 1.2, On budget and ahead of schedule

CV = EV-AC = 24-24 = 0, CPI = EV/AC = 24/24 = 1.0, SPI = EV/PV = 24/20 = 1.2
When CPI is 1.0 project is on budget and SPI greater than 1.0 it is ahead of schedule

25. Ans.: A - SV= -10 man-days, CPI=1.0, SPI=0.8, on budget and behind schedule

SV= EV – PV = 40 – 50 = -10 man-days, CPI = EV/AC = 40/40 = 1.0,
SPI = EV/PV = 40/50 = 0.80, CPI = 1.0, so it is on budget, SPI = 0.80 which is less than one, thus it is behind schedule

26. Ans.: All of These

Earned value, variance analysis, trend analysis, and reserve analysis are all part of the data analysis tools. The "To Complete Performance Index" is another tool supporting the control costs process.

27. Ans.: B - EAC = AC + BAC – EV

Subtracting the EV from the BAC yields the PV required to complete the project. Completing the project at the planned rate is operating at 100% to finish the project, which means the EV to complete the project will equal the planned value to complete the project. When CPI is the same for entire project EAC = BAC/CPI. Bottom up involves a re-estimate. When both SPI and CPI are used in the calculations, they both influence the rate at which the remaining work is completed.

28. Ans.: A - TCPI to meet budget is 0.67, If TCPI equals CPI the EAC is $53.3K

TCPI = (80-50)/80-40) = 30/40 = 0.75.
If TCPI equals CPI, the CPI which is 50/40 = 1.25 applies to the entire project.
Thus EAC = BAC/CPI = 80/1.25 = $64K

29. Ans.: D - TCPI to meet budget is 1.33, If TCPI equals CPI the EAC is $100K

TCPI = (80-40)/80-50) = 40/30 = 1.33.
If TCPI equals CPI, the CPI which is 40/50 = 0.80 applies to the entire project.
Thus EAC = BAC/CPI = 80/0.80 = $100K

30. Ans.: B - SPI greater than 1.0, CPI greater than 1.0, TCPI less than 1.0

When SPI and CPI are greater than 1.0 it indicates the project has performed better than the plan, but TCPI represents future performance needed to meet the budget which ideally should be less than the plan (less than 1) to provide contingency for unknowns and ensure success.

31. Ans.: B - All change requests are formally controlled from project initiation

The formal change control process is employed after the baselines have been set. Changes introduced prior to establishing the baselines do not go through the formal process. This allows the initial planning prior to setting the baseline to go smoothly and efficiently.

32. Ans.: A - Integration Knowledge Area, Monitoring and Controlling Process Group

Change control is an integral part of monitoring and controlling the project and all changes require integration into the project making it part of Integration Management.

33. Ans.: B - Testing and Inspections

Testing and inspections are appraisal costs, which are considered conformance costs within the Cost of Quality.

34. Ans.: C - Affinity Diagram

The affinity diagram is most often used in conjunction with brainstorming to organize thoughts into groups to better visualize all the concepts and see logical connections among the items.

35. Ans.: D – All of These

The best answer is all of these, since all three processes within the Quality Management Knowledge area use all three tools

36. Ans.: A - Manage Quality, Monitor Risks, Control Procurements

The PMBOK identifies audits as a tool for Manage Quality, Monitor Risks, Control Procurements. While audits may be employed in other areas, these are the processes most likely to use audits.

37. Ans. A - Influencing and negotiation skills

Diane will need significant influencing and negotiation skills to get her peers to release critical skills to the project and convince prospective engineers of the advantages of the new assignment.

38. Ans. B - Work with Art's boss, during the planning process to establish expectations and ask to participate in Art's annual review.

Both Art and his boss must understand and agree with project expectations to avoid Art getting mixed directions. Participation in Art's review ensures Art will be motivated and receive credit for the work he does on the project. Art would be seriously under-utilized if dedicated to the Bakersfield project and this might hurt other aspects of GMI organization.

39. Ans.: D Change Requests

A change request is not an input to any process except perform integrated change control, since it must be approved before impacting the project. The issue log and lessons learned register are project document inputs to manage team that must also be updated as outputs. Schedule and cost baselines are part of the Project Management Plan input to the manage team process that require updating as outputs. Enterprise environmental factors are inputs to manage team and updates are outputs of the process.

40. Ans.: A Ensures assignment and availability of all resources as well as monitoring and taking corrective action when necessary

Control resources only applies to the physical resources such as equipment, materials, infrastructure, and facilities. The human resources fall under the Manage Team process. The negotiation and influencing skills are part of the interpersonal and team skills. Risk register and issue log are part of the project documents input.

41. Ans.: B – Collaborate

Collaborate requires a lot of input and involvement from all interested parties to agree on a solution that is best for the entire project which makes it the preferred method. Best for the project is not a compromise or bargaining process, but rather a solution that yields the best project result. Avoiding simply ignores the issue and smoothing involves accepting one position to avoid conflict.

42. Ans.: B – Collaborate

Collaborate requires a lot of input and involvement from all interested parties to agree on a solution that is best for the entire project. It takes the most time to achieve the best project result which makes it the preferred method. Best for the project is not a compromise or bargaining process, but rather a solution that yields the best project result. Avoiding simply ignores the issue and smoothing involves accepting one position to avoid conflict.

43. Ans.: A – Personalities

Personality problems can destroy teamwork and result in project failure. They are considered the most damaging.

44. Ans.: B – Schedules

Schedules are the most common source of conflict in projects.

45. Ans.: C – Referent

Referent refers to the high level of credibility or admiration that an individual has with another individual.

46. Ans.: C – Emotional Intelligence

Emotional Intelligence is defined as the ability to identify, assess, and manage emotions of yourself, individuals, and groups.

47. Ans.: D – Mitigate

Accepting the risk is not an option due to the probability and impact on the project. Transferring the risk through purchasing insurance would protect the cost element but not the timing impact. Selecting a different equipment mover might be considered avoidance. While a different mover might significantly reduce the risk of delivery, loading, and rigging, they still exist with any mover. A better answer would be to mitigate the risks by conducting a joint customer supplier problem solving session to generate ideas to further reduce risks with the current mover or another mover with a higher performance record.

48. Ans.: A – Exploit

Exploit involves taking specific actions to capture the opportunity such as ensuring there are no conflicts with existing contracts and establishing a purchase order for the discounted steel. Enhancing does not apply since the opportunity is already in place. Accepting and sharing do not fit in this situation.

49. Ans.: A - Risk identification, Risk Management. Planning

Risk identification establishes the risk register as an output. All subsequent risk processes update the risk register as part of the project documents update.

50. Ans.: D - All of These

The P/I matrix defines the terms or numerical values for reporting probability and impact. The RBS provides a hierarchical chart of risk sources. The overall strategy describes the approach to managing risk.

51. Ans.: D - Monte Carlo simulations model risk scenarios

The Monte Carlo simulation is a data intensive model used for quantitative analysis

52. Ans.: D - All of These

Expert judgement, data gathering, data analysis, and representations of uncertainty are all tools used in quantitative risk analysis.

Chapter 6 Project Manager Role – Answers with explanations

1. **Ans.: A – Situational**

   Situational Leadership is a selection of 4 different styles based on readiness and willingness of the individual or team. Democratic everyone participates, Transformational is relationship focused, and in Laissez Faire the team drives decisions with little leadership involvement.

2. **Ans.: C - Defines how to achieve the vision**

   Management is more task oriented thus defining how to achieve the vision management not leadership. Leadership is big picture oriented and requires coaching and mentoring to develop the skills, while management skills can be taught.

3. **Ans.: D – All of These**

   Consensus requires all of these in addition it requires an honest effort by everyone to reach agreement without anyone blocking the decision through non agreement.

4. **Ans.: A - Expert Leader**

   In an obvious crisis where time is of the essence and no prior plans have been developed the expert leader approach is best. If Diane has the knowledge, she can make the decisions or delegate the decisions to the appropriate expert within her team.

5. **Ans.: C - Technical Project Management, Leadership, Strategic/Business Management**

   The Talent Triangle reflects a more enlightened approach to project management that encompasses Leadership and Strategic/Business Management as well as the traditional technical aspects of project management.

6. **Ans.: D – All of These**

   Role of the project manager is very broad: leading, planning and coordinating the project. The project manager establishes formal and informal communication networks among all stakeholders while balancing constraints with available resources.

7. **Ans.: C - Expertise and experience in the project industry**

   While expertise and experience in the industry is desirable, it is not a requirement. If the PM's expertise is too great, the PM may spend too much time in the area of expertise at the expense of managing the project.

8. **Ans.: B - Politics are always an obstacle in project planning and execution**

   Politics properly leveraged can be beneficial in helping to get things done in the project. It is important to understand the politics of an organization that explain how the organization works beyond the traditional organization charts.

9. **Ans.: D – All of These**

Balance is required in all aspects of a project. Scope, time, and cost must be balanced during execution of project activities. Project value, resources, and strategic fit require balance within the portfolio. Needs of team, customer, and company require balance as well.

10. **Ans.: A - Issue log and changes requests**

Only approved change requests are inputs, and the issue log is an output not an input. EEF and OPA are inputs. Project Schedule, Milestone list, Risk Register, and Risk report are part of the project documents input to the process.

11. **Ans. A - Direct and Manage Project Work**

According to the PMBOK page 96 the issue log is first created as an output of Direct and Manage Project Work and is the correct response for certification testing. In the author's experience, the issue log is created earlier during initiating as part of stakeholder identification which enables the issue log to support stakeholder engagement.

12. **Ans. D - All of These**

All the items listed are outputs of direct and manage project work.

13. **Ans.: C – Checklist**

The checklist can be set up as a template to ensure items are completed. Adding signature, date, and file retention allows the checklist to become project documentation. If a form ID, revision level, and level revision date are also added, it can become a process control document. The PMBOK identifies this tool with develop the project management plan, manage and control quality, and identify risks, but the author recommends also using it in other areas such as direct and manage project work, manage project knowledge, managing stakeholder engagement, etc.

Chapter 7 Project Closure – Answers with explanations

1. **Ans. C - Enterprise Environmental Factors**

The project is complete thus enterprise environmental factors are not an input and have no effect on the Close Project or Phase process.

2. **Ans.: D - Updates to Enterprise Environmental Factors**

The project is complete, and this is the administrative or transitional activity to close the project thus there are no updates to the enterprise environmental factors.

3. **Ans.: A - Validate Scope**

Formal acceptance/approval of a deliverable is part of the Validate Scope process. During equipment run off they were in the Quality Control process verifying deliverables. During the equipment manufacture Manage Quality occurred through various quality reports and testing and Control Quality occurred through various quality measurements. This was an interim deliverable and not part of project close, while accepted interim deliverables would be an input to a Close Phase process.

4. **Ans.: C - Transition of Final Product to another group or organization**

The primary output of the Close process is to transition the deliverables to the next group while generating the final report and updating project documents and OPA. Verification of deliverables is Control Quality, Formal approval of deliverables is Validate Scope, and final closure of procurement documents is a purchasing function outside of project management.

5. **Ans.: B - Manage Project Knowledge, Executing, Integration Management**

The Lessons Learned Register is an output of Manage Project Knowledge which is part of the executing process group. Lessons learned crosses all knowledge areas and thus is part of Integration Management.

6. **Ans. D - Recommendations are implemented immediately after the close of the project**

Waiting till end of the project does not benefit the current project. The purpose for creating the lessons learned register early is to capture all lessons learned and implement any recommendations that apply to improve the current project.

7. **Ans.: D - Validation of Deliverables**

Each project is unique with a particular set of deliverables. Each project validates its own set of deliverables. The other items (resource, cost, timing) could prove useful on a similar project.

8. **Ans.: A.   Thank the contractor but decline explaining that lunch could be perceived as a conflict of interest since Eric was still evaluating the bids.**

Project managers must always avoid any perceived bias or favoritism when evaluating bids even within company guidelines. This is not a conflict of interest for the electrical contractor. Actual or perceived sharing of bid information are equally destructive in vendor relationships.

9. **Ans.: D - Thank them and accept, then report it to BCI and their customer GMI. Seek disposition of the statue from both BCI and GMI.**

It is important to understand and work within the cultural norms of project partners, while maintaining your integrity and ensuring no conflict of interest exits. Many companies turn these gifts over to charities or some other means to benefit people in need.