

APPENDIX

Project Management: Tools, Techniques and Tips

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About the Instructor

Steven M. Fullmer, MBA, PMP. PMI-PBA, CQ

Steven Fullmer has a global reputation as a project manager, chief technology officer, and computer systems innovator. He is an established author and business analyst. He has more than thirty-six years of professional design and project management experience in finance and high technology firms with companies such as Honeywell Large Computer Products, NEC Supercomputers, First Interstate Bank, Wells Fargo Bank, AG Communication Systems, and Lucent Technologies.

One of his first engineering assignments resulted in the first dynamic I/O configuration system for super computers and its presentation in Tokyo, Japan. He was the lead engineer in the design of personal computer, network processing for First Interstate Bank retail banking, and later designed and implemented the first firewall and web service delivery for the bank. During his First Interstate tenure, he served on the CommerceNET team that promoted the SSL/HTTPS protocol still commonly used for Internet security. He also moderated the first national firewall panel discussion at Stanford University as a CommerceNET lead. While with Wells Fargo bank, he managed teams responsible for the development of encryption protocols used in ATMs and wireless banking security, while contributing to other Internet and Intranet technology development.

During nine years with AG Communication systems, he was a consultant to the design of Voice-over-Internet-Protocol services widely used today. He also served as project manager and designer for dozens of Internet and Intranet based business solutions for customers, AG Communication Systems, and joint venture partner Lucent Technologies. He was instrumental in the Lucent project team that merged more than 5,000 Internet points of presence into a single Lucent web service. Several of his projects were used to prototype the Lucent Project Management Office.

Mr. Fullmer is an active member of the Project Management Institute, receiving his Project Management Professional certification in 2004. He served six years as a Director for the Phoenix Chapter of PMI, and actively participates in several global centers of practice. He was also the founding Vice President of Membership for the Phoenix Chapter, International Institute of Business Analysis. As a business analyst and technologist, he authored dozens of major global developer surveys for Evans Data Corporation, creating several analytical models for software adoption trending. He is a past author for Dr. Dobb's Journal, InformIT, CIO, and One Planet Magazines, and continues to provide technical blog content for Interface Technical Training.

He holds BA degrees in Chemistry and Biology from Willamette University, studied graduate level Neurochemistry at Arizona State University, and completed an MBA at Arizona State University in 1993 graduating first in his class.

Mr. Fullmer is also active in his community serving the Boy Scouts of America for more than 45 years. He is a past president of the Heard Museum Council, and former Liberty Wildlife Rehabilitation Foundation department director and federally licensed rehabilitator. He served the Brophy College Preparatory Dads' Club for four years as a vice president, and the Xavier College Preparatory Dads' Club as president (2013-2014). He is a former Advisory Board Member for Xavier College Preparatory – a 2013 National Blue Ribbon School.

He is currently the president of Blue Sphere Solutions, providing outsourced chief technology officer services to emergent and growth oriented businesses with a technological focus. He is also a staff instructor at Interface Technical Training, providing PMI®, CompTIA, and Microsoft Certification course instruction.

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Course Exercises

(and related document examples)

Project Charter

Project Name:	Office Relocation Project	
Project Purpose:	Identify and facilitate relocation of business offices and operations within the same city. Planning to begin upon authorization. Location, contract negotiation, buildout, and relocation to completed within 90 days of relocation funding .	
Project Description:	To identify, select and move to new operations location.	
Project Start Date:	Immediate	Project End Date: 90 days from relocation funding date
Prepared By:	John Smith	Role: Business Analyst
Prepared Date:	January 1, 2018	

Goals	Objectives
<ol style="list-style-type: none"> 1. To identify, select and move all operations to a new location in accordance with <i>Move Guidelines</i> to be established during project planning. 2. To devise a moving plan to be referenced for future events. 3. To involve employees in the process of selecting, preparing for, and affecting a new operations location. 4. To affect smooth business transition, potentially with overlapping operational locations. 	To maintain business operations, improve service offerings, and maintain IRR.

Project Critical Success Factors:

- Identify a minimum of 3 potential locations.
- Develop projections to forecast operational costs at potential location.
- Provide a recommendation for operations location.
- Develop a process to affect office location that affects business continuity.
- Develop a moving budget and moving plan.

Project Budget	Amount
1. Planning Budget	\$100,000.
2. Moving Budget	To be determined pre-funding.
Allowable variance	10%

Project Funding:

All funding to be provided by corporate management.

Project Conditions

Project Assumptions:

- Operational relocation is mandated by lease renegotiation and operations margins.
- All employees must participate in planning and relocation efforts to affect continuity.
- Operations can continue with the desired Internal Rate of Return.
- Timing for the move is mandated at 90 days prior to current lease termination.

Project Constraints:

- Project cannot overrun budget by more than 10% without prior negotiation with sponsor.
- No contracts may be negotiated or promises made to vendors until a formal bid and selection process has been completed and approved by the sponsor/customer.

Sponsor: Also serves as project customer. Responsibilities include: approve the project charter and plan; secure resources for the project; confirm the project’s goals and objectives; keep abreast of major project activities; make decisions on escalated issues, assist in the resolution of project issues.

Sponsor’s Name: The Boss Contact Information: TheBoss@GitErDun.com 602 555-1212

Project Manager: Leads in the planning and development of the project; manages the project execution to approved scope.

Responsibilities include: develop the project plan; identify project deliverables; identify risks and develop risk management plan; direct the project resources (team members);scope control and change management; oversee quality assurance of the project management as planned.

Project Manager: Bob the Builder Contact Information: Bob@GitErDun.com 602 555-1234

- Approved.
- Approved, but project is on hold until future notice.
- Revise charter and resubmit for approval.
- Charter rejected.

Approved By:

Project Sponsor

Date

Office Relocation Requirements Checklist

Requirement	Category	Verified
Research new location	Location	
Review floor plan	Location	
Schedule buildout	Construction	
ID work areas	Floor plan	
ID personal office spaces	Floor plan	
ID server room	Floor plan	
ID Copier locations	Floor plan	
ID storage locations	Floor plan	
Reproduce Keys	Security	
Cube assembly	Construction	
ID printer locations	Floor plan	
Office furniture delivery	Moving	
Box/storage delivery	Moving	
Notify personnel	Communication	
Coordinate move-in	Communication	
Define phone needs	IT	
Order new phone setup	IT	
Order new phones	IT	
Setup new phones	IT	
Order network cabling	Construction	
ID power outlet locations	Construction	
Install routers/switches	IT	
Test network connectivity	IT	
ID wireless access locations	Floor plan	
Install wireless access points	IT	
Install printers	IT	
Test Printers	IT	
Test network	IT	
Schedule move dates	Schedule	
Approve floor plan	Management	
Move personnel	Moving	
Order new office furniture	Equipment	
Order new supplies	Equipment	
Inventory business card needs	Supplies	

Order new business cards	Supplies	
Inventory equipment	Inventory	
Inventory systems	Inventory	
Inventory software	Inventory	
Inventory boxes (count, etc.)	Inventory	
Backup systems	IT	
Test backup recovery	IT	
Develop contingency plans	Management	
Develop continuity plans	Management	
Complete wiring and cabling	Construction	
Install furniture	Operations	
Install work stations	IT	
Install signage	Operations	
Notify customers	Communications	
Notify vendors	Communications	
Review new vendor needs	Operations	
Identify time off/down time	HR	
Press release	Marketing	
New signage	Marketing	
Install new signage	Operations	
Tell employees to pack	Communications	
Test work stations and phones	IT	
Setup new support guidelines	IT, Operations, HR	
ID parking options	Location	
Negotiate new parking	Management	
Assign new parking	HR	
Identify server room needs	IT	
Develop new IT infrastructure	IT	
Approve new IT infrastructure	Management	
Acquire new IT infrastructure	IT	
Install new IT infrastructure	IT	
Manage budget	Accounting	
Develop budget	Management	
Develop requirements	PM	
Coordinate requirements	PM	
Project plan	PM	
Internal customer requirements	PM	

Physical structure requirements	PM	
Site selection	PM, Management	
Contract/lease	Management/accounting	
ID maintenance needs	Operations	
Negotiate maintenance needs	Management/accounting	
New location insurance	Management/accounting	
Website update	Marketing	
Print material update	Marketing	
Studio requirements	Marketing, PM, Operations	
Studio equipment purchase	IT	
Studio build out	Construction	
Studio test	IT, Marketing	
Lobby design	Floor plan	
Lobby build out	Construction	
Breakroom design	Floor plan	
Breakroom build out	Construction	
Breakroom equipment/supplies	Operations	
Food/service delivery	Operations	
Services maps (new location)	Operations	
Packing materials disposal	Operations	

Office Relocation Requirements Checklist

Requirement	Category	Verified
Manage budget	Accounting	
Notify vendors	Communications	
Coordinate move-in	Communication	
Notify personnel	Communication	
Notify customers	Communications	
Tell employees to pack	Communications	
Breakroom build out	Construction	
Complete wiring and cabling	Construction	
Cube assembly	Construction	
ID power outlet locations	Construction	
Lobby build out	Construction	
Order network cabling	Construction	
Schedule buildout	Construction	
Studio build out	Construction	
Order new office furniture	Equipment	
Order new supplies	Equipment	
Breakroom design	Floor plan	
ID Copier locations	Floor plan	
ID personal office spaces	Floor plan	
ID printer locations	Floor plan	
ID server room	Floor plan	
ID storage locations	Floor plan	
ID wireless access locations	Floor plan	
ID work areas	Floor plan	
Lobby design	Floor plan	
Assign new parking	HR	
Identify time off/down time	HR	
Inventory boxes (count, etc.)	Inventory	
Inventory equipment	Inventory	
Inventory software	Inventory	
Inventory systems	Inventory	
Acquire new IT infrastructure	IT	
Backup systems	IT	
Define phone needs	IT	

Develop new IT infrastructure	IT	
Identify server room needs	IT	
Install new IT infrastructure	IT	
Install printers	IT	
Install routers/switches	IT	
Install wireless access points	IT	
Install work stations	IT	
Order new phone setup	IT	
Order new phones	IT	
Setup new phones	IT	
Studio equipment purchase	IT	
Test backup recovery	IT	
Test network	IT	
Test network connectivity	IT	
Test Printers	IT	
Test work stations and phones	IT	
Studio test	IT, Marketing	
Setup new support guidelines	IT, Operations, HR	
ID parking options	Location	
Research new location	Location	
Review floor plan	Location	
Approve floor plan	Management	
Approve new IT infrastructure	Management	
Develop budget	Management	
Develop contingency plans	Management	
Develop continuity plans	Management	
Negotiate new parking	Management	
Contract/lease	Management/accounting	
Negotiate maintenance needs	Management/accounting	
New location insurance	Management/accounting	
New signage	Marketing	
Press release	Marketing	
Print material update	Marketing	
Website update	Marketing	
Studio requirements	Marketing, PM, Operations	
Box/storage delivery	Moving	
Move personnel	Moving	

Office furniture delivery	Moving	
Breakroom equipment/supplies	Operations	
Food/service delivery	Operations	
ID maintenance needs	Operations	
Install furniture	Operations	
Install new signage	Operations	
Install signage	Operations	
Packing materials disposal	Operations	
Review new vendor needs	Operations	
Services maps (new location)	Operations	
Coordinate requirements	PM	
Develop requirements	PM	
Internal customer requirements	PM	
Physical structure requirements	PM	
Project plan	PM	
Site selection	PM, Management	
Schedule move dates	Schedule	
Reproduce Keys	Security	
Inventory business card needs	Supplies	
Order new business cards	Supplies	

Exercise 5.1

Extend the Work Breakdown Structure for the following project:

Scope: Create a Work Breakdown Structure for the project to relocate an entire office space to a new facility across town.

Consider the Charter, and these major objectives

- Project Management
- Site Selection
- Office Design
- Construction
- Transition
- IT
- Operations
- ????

If you are aware of additional high order Objectives, include them.

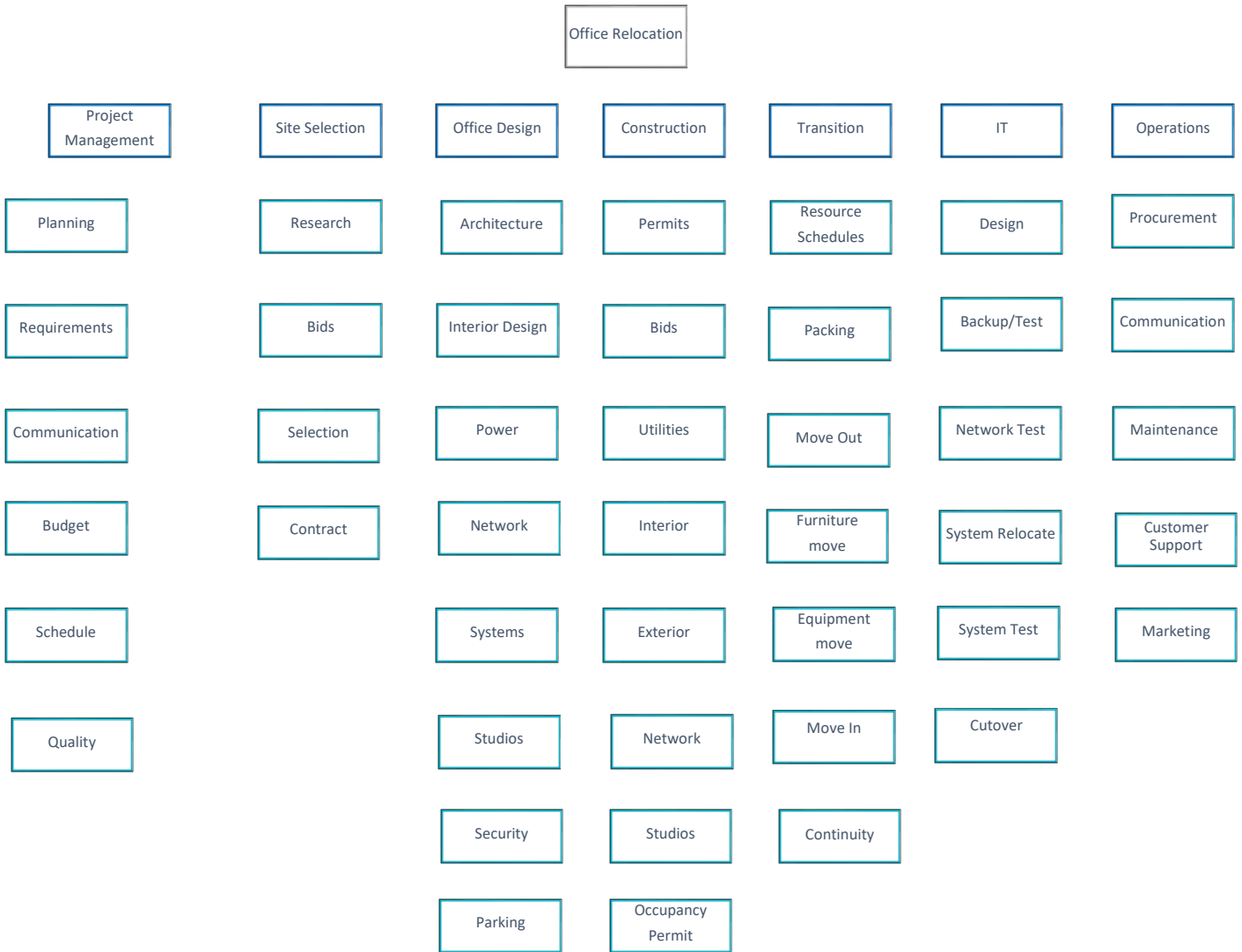
Working independently or with a team, extend the Work Breakdown Structure for this project.

In actual application, be inclusive. Make sure everyone participates. Participation leads to understanding and commitment.

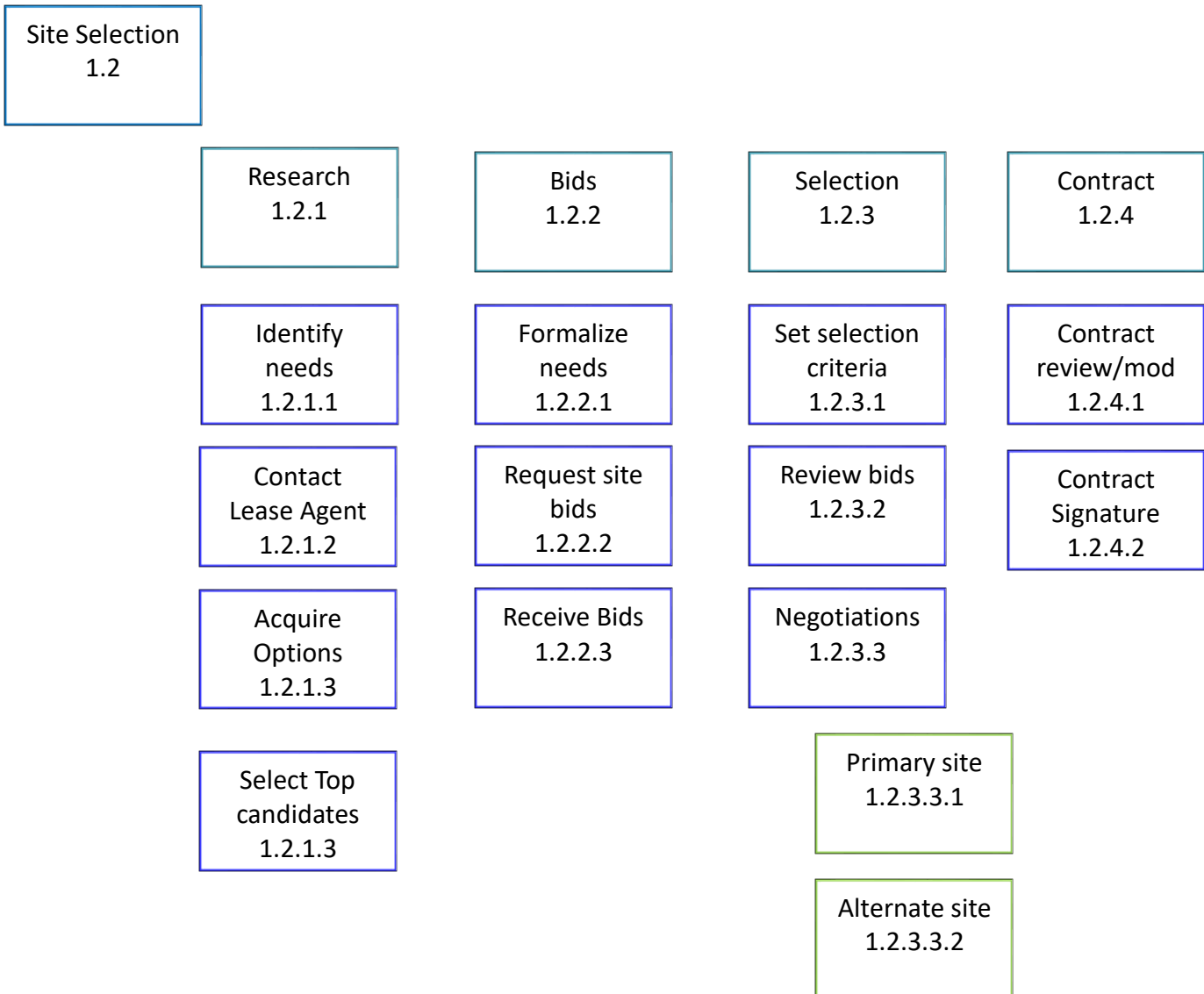
Identify the work packages for at least one objective by **Decomposing** from the Objective through the Deliverables, to sub-deliverables, and finally to the work package level.

Hint: Take an objective with which you are most familiar when working alone. This will allow you to perform either a top down (decomposition) or bottom-up (integration) approach.

Activity 5.1: Office Relocation Project WBS



Activity 5.1 Possible Answer extending site selection



Work Breakdown Structure

Project Name:

Department:

Focus Area:

Product/Process:

Prepared By

Document Owner(s)	Project/Organization Role

Project Closure Report Version Control

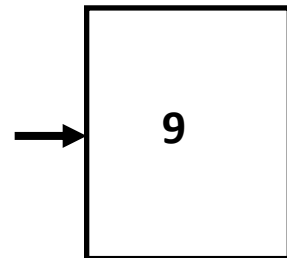
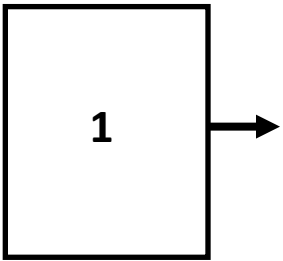
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			Created document.

Work Breakdown Structure Purpose and Limitations
<p><i>[Replace this text with a statement of the purpose and limitations of this worksheet, or use the following sample.]</i></p> <p><i>The purpose of this worksheet is to:</i></p> <ul style="list-style-type: none"> • Identify the work to be done. • Identify the types of resources required for the work. • Develop estimates for each work element. • Identify storage locations. <p><i>This worksheet does not address:</i></p> <ul style="list-style-type: none"> • Who will perform the work. • When the work will be completed.

Work Breakdown Structure Worksheet

Work ID	Work Name	Description	Include (Completion Criteria)	Customer	Asset Type	Complexity	Estimated Effort	Skill Required	Dependency	Hand Off To	Storage/Location
1.0											
1.1											
1.1.1											
1.1.2											
1.1.3											
2.0											
2.1											
2.1.1											
2.1.2											

Activity 6.1 - Plan Ski Trip – Activity Sequencing

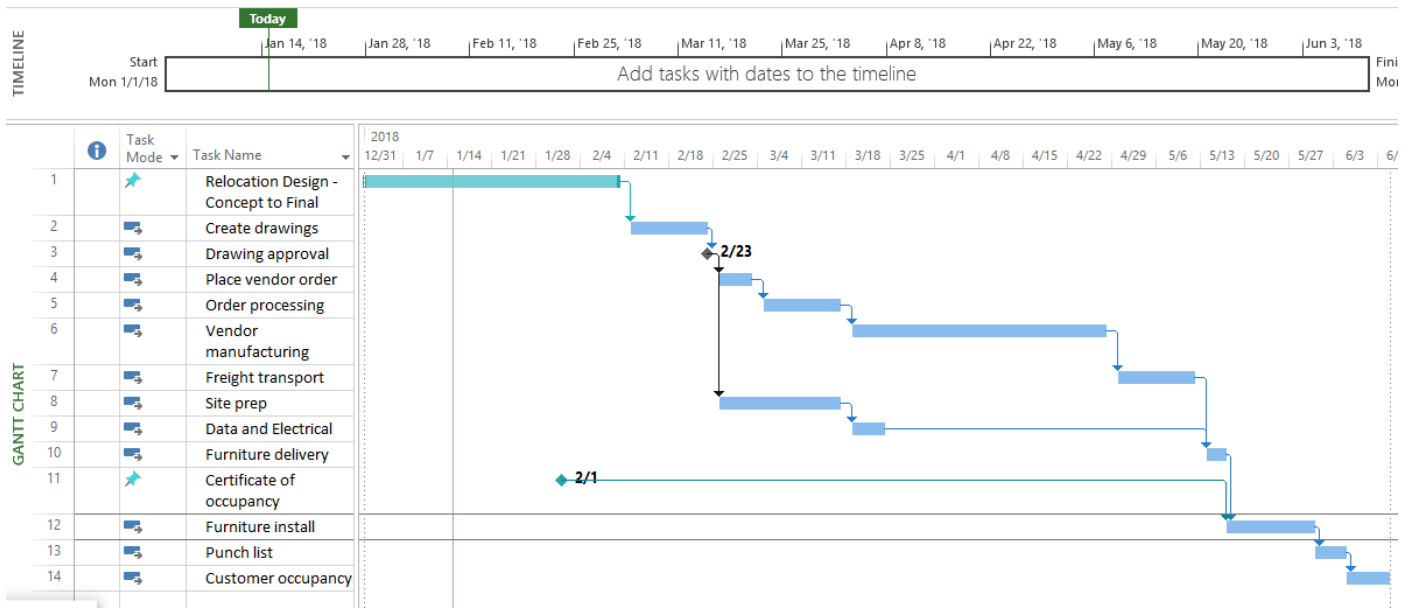
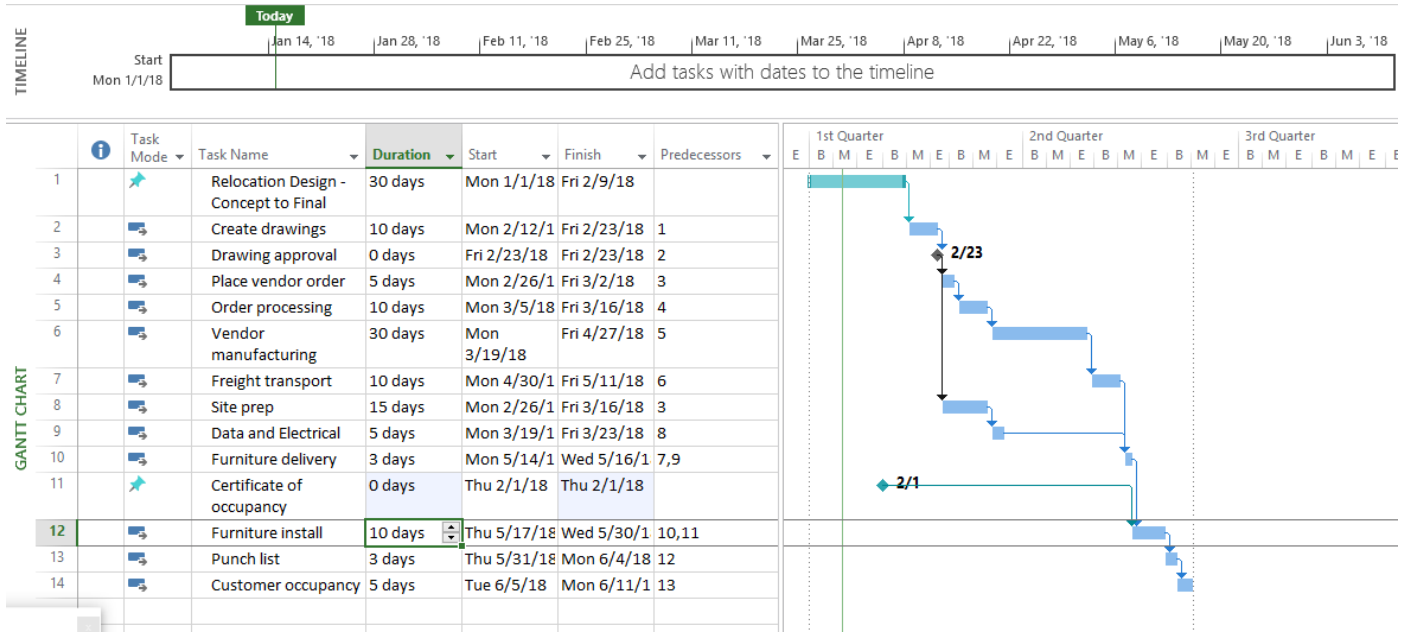


Activity 6.2 - Three Point Estimating

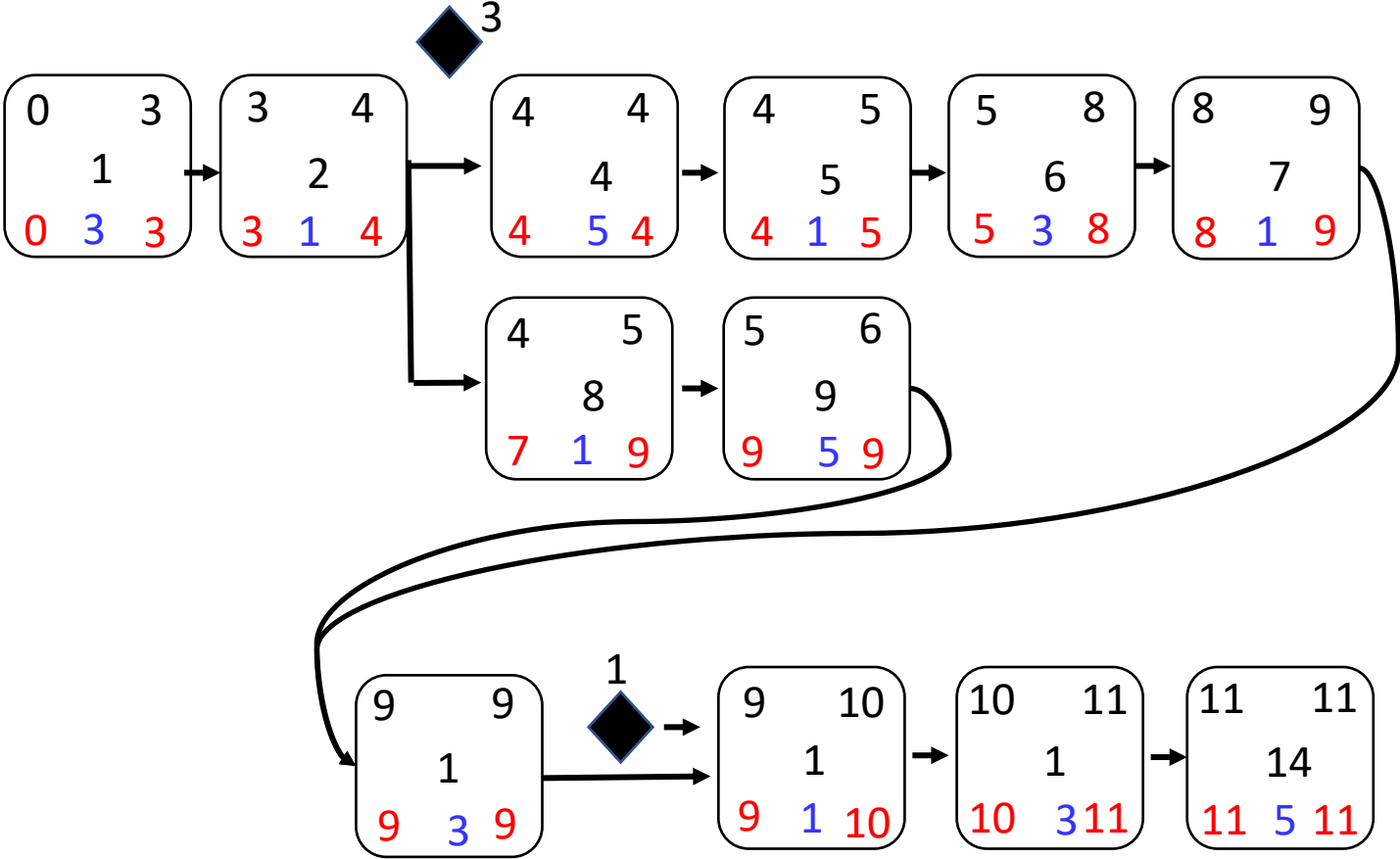
Activity	Optimistic	Most Likely	Pessimistic	Three-Point Estimate
100	3	6	10	
200	3	4	6	
300	7	10	12	
400	3	5	9	
500	1	2	4	
600	4	5	9	
700	3	4	7	
800	7	12	15	
900	3	6	10	

TOTAL	34	54	82	
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Office Relocation PDM



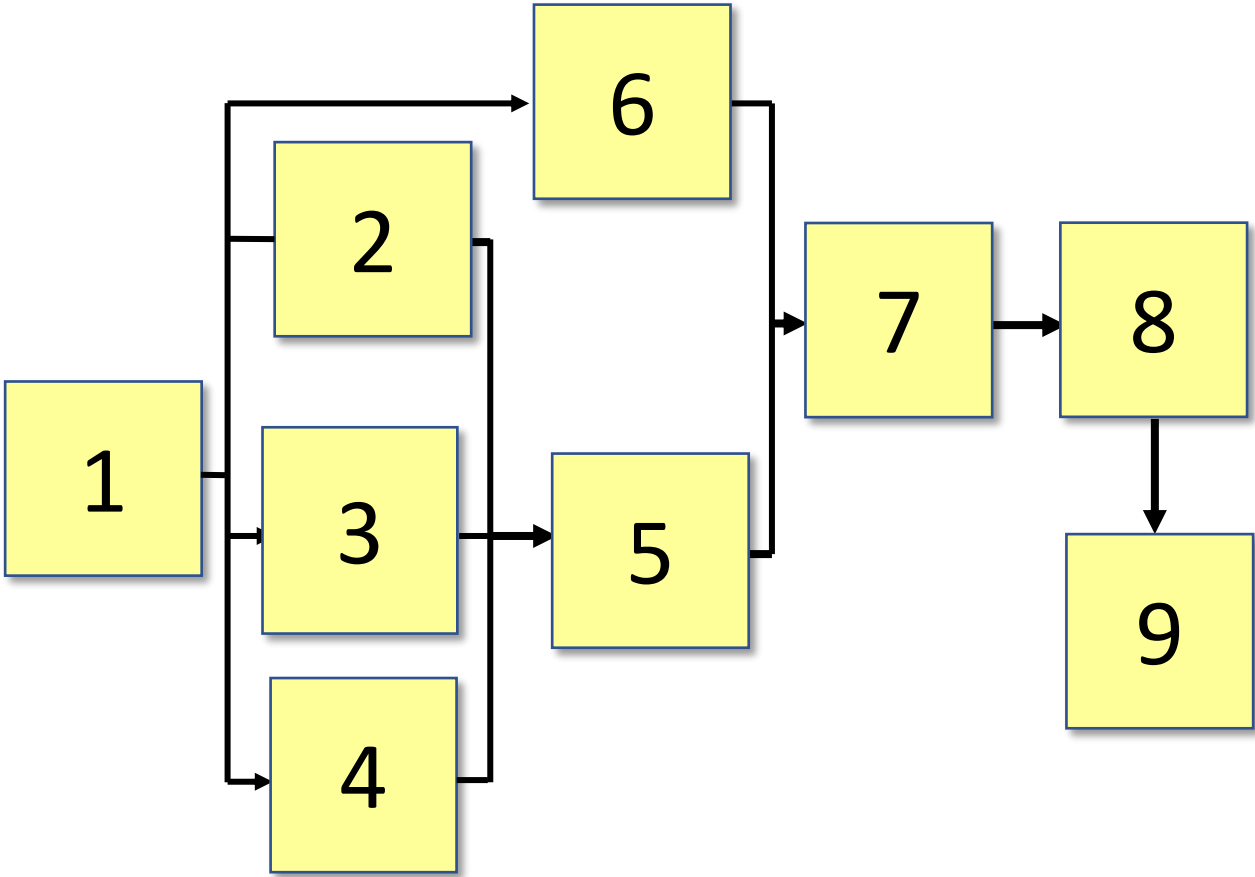
Office Relocation PDM



Ski Trip Precedence Diagram

Use the diagram you created two pages previous in the Appendix Workbook, and the following table of durations. Calculate the critical path, float, and your arrival time based upon an 8:00 AM departure.

<u>ACTIVITY</u>	<u>DESCRIPTION</u>	<u>DURATION</u>	<u>PRECEDENCE</u>
1	Get kids dressed	30 min.	
2	Make sandwiches	20 min.	Do 1 first
3	Make hot chocolate	15 min.	Do 1 first
4	Gather snack food	10 min.	Do 1 first
5	Pack food	15 min.	Do 2, 3, 4 first
6	Gather ski equipment	20 min.	Do 1 first
7	Load the car	15 min.	Do 5 & 6 first
8	Get gas	10 min.	Do 7 first
9	Drive to ski slope	90 min.	Do 8 first



ACTIVITY	BUDGETED COSTS
Relocation Design	
Create Drawings	
Place Vendor Order	
Order Processing	
Vendor Manufacturing	
Freight Transport	
Site Prep	
Data & Electrical	
Furniture delivery	
Furniture Install	
Punch list	
Customer Occupancy	

Activity 7.1 Develop Cost Estimates

Activity 7.2. Cost Baseline

Activity	Budgeted Cost \$K	JAN	FEB	MAR	APRIL	MAY	JUNE
Relocation Design	\$ 29,000						
Create Drawings	\$ 3,500						
Place Vendor Order	\$ 50,600						
Order Processing	\$ 1,000						
Vendor Manufacturing	\$ 3,000						
Freight Transport	\$ 3,000						
Site Prep	\$ 31,800						
Data & Electrical	\$ 4,500						
Furniture delivery	\$ 59,000						
Furniture Install	\$ 26,000						
Punch list	\$ 2,000						
Customer Occupancy	\$ 8,900						
Total	\$222,300						
Cumulative Costs							

Earned Value Calculations

These activities are best performed within your courseware manual, which has been designed to provide condensed information needed for the activities.

Activity 8.3 - Earned Value Exercise

Determine the status of each case (i.e., Over budget, under budget, behind schedule, ahead of schedule, etc.)

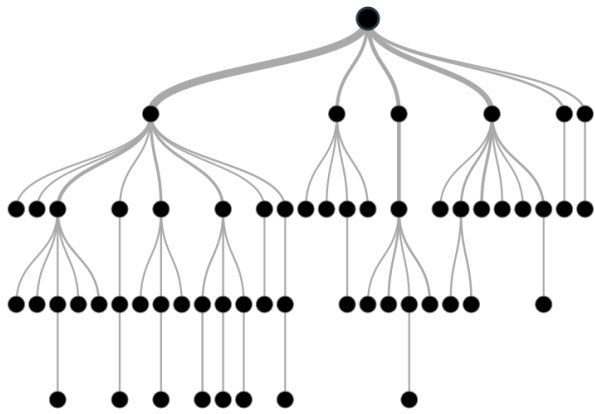
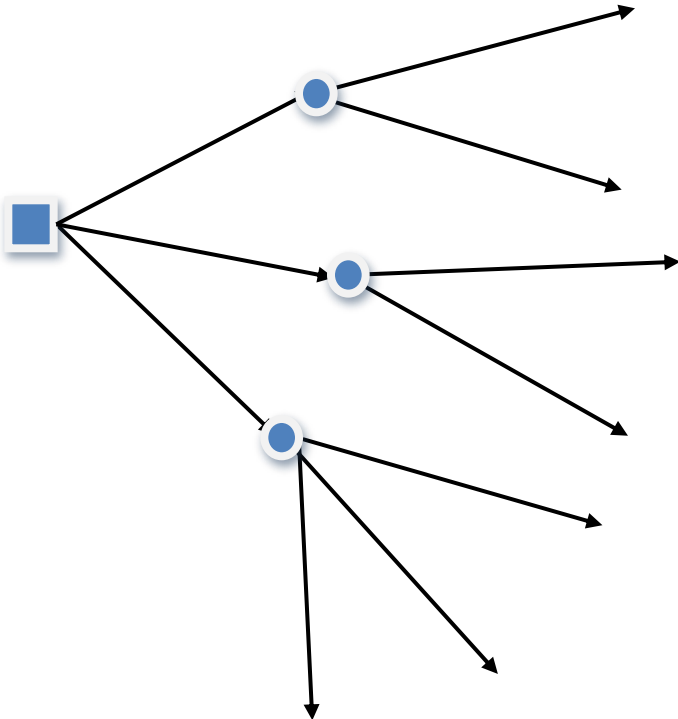
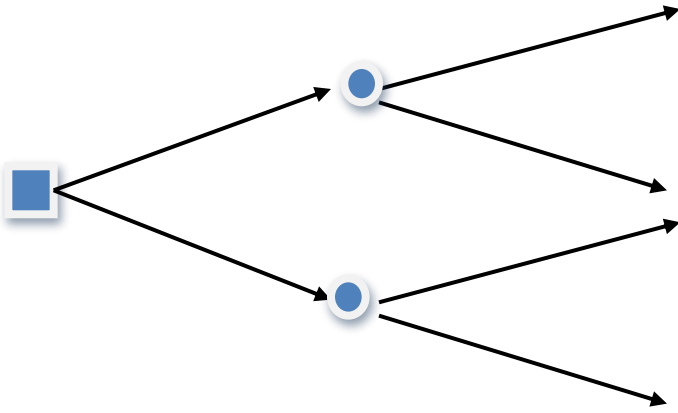
CASE	PLANNED VALUE	ACTUAL COSTS	EARNED VALUE	COST STATUS?	SCHEDULE STATUS?
1	1,000	1,000	1,000		
2	1,000	600	500		
3	1,000	500	600		
4	1,000	700	700		
5	1,000	1,000	600		
6	1,000	1,000	1,200		
7	1,000	1,200	1,200		
8	1,000	600	1,000		
9	1,000	1,400	1,200		
10	1,000	1,200	1,400		

Activity– Risk Identification

Identify at least seven risk events associated with the sinking of the Titanic from the movie(s), history, or your recollection of the story.

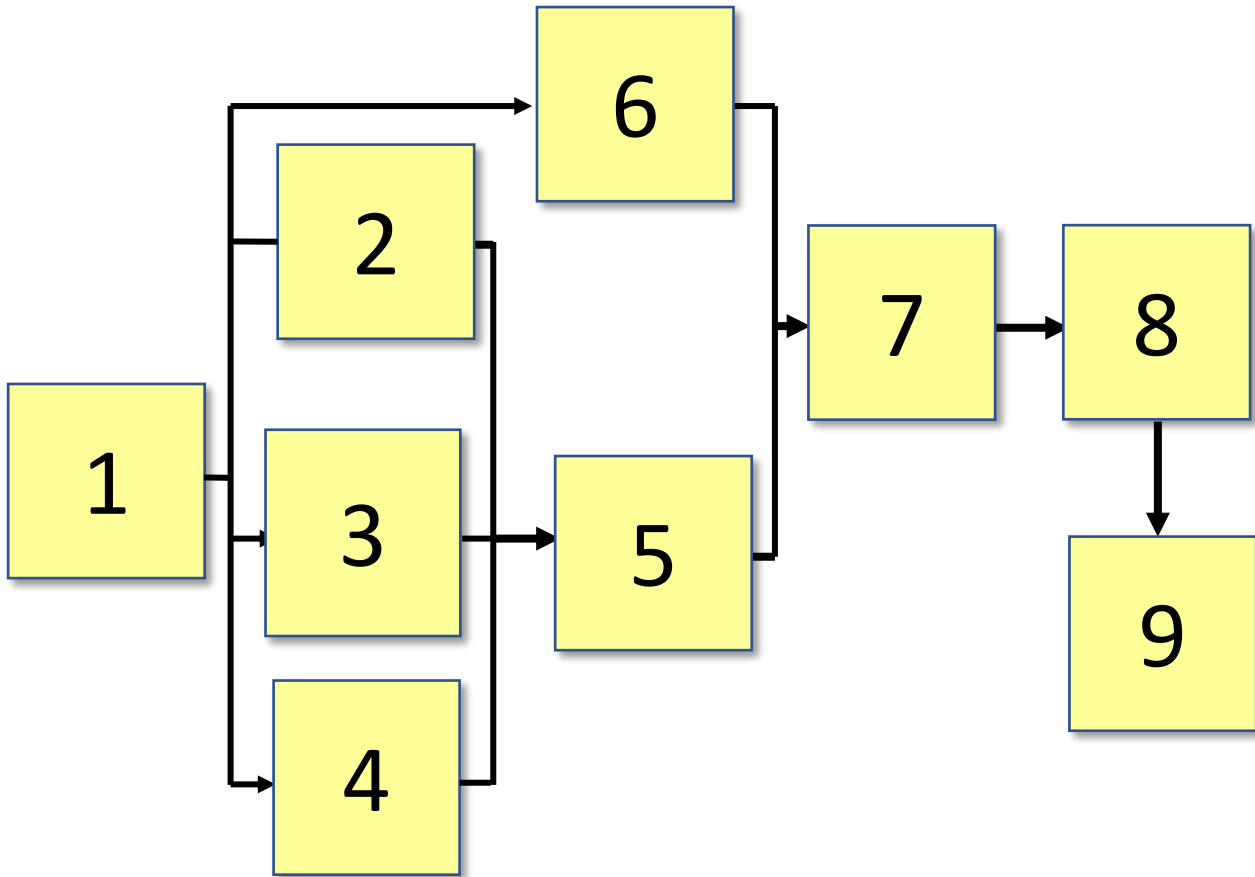
Risk Event	Impact

Creating a Decision Tree



Exercise Solutions

Activity 6.1 – Ski Trip Activity Sequence – Answer

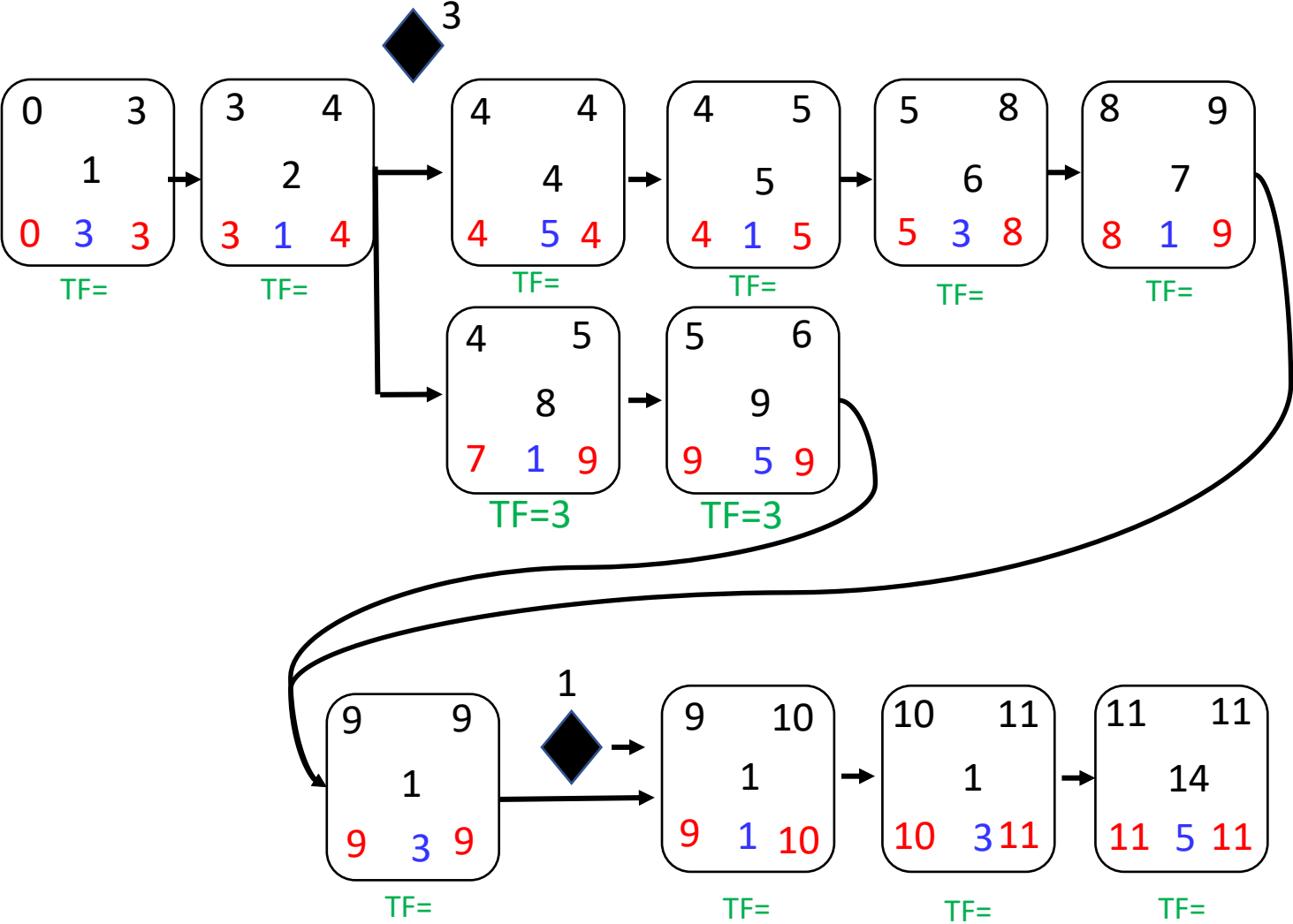


Activity 6.2 – Three Point Estimating - Answer

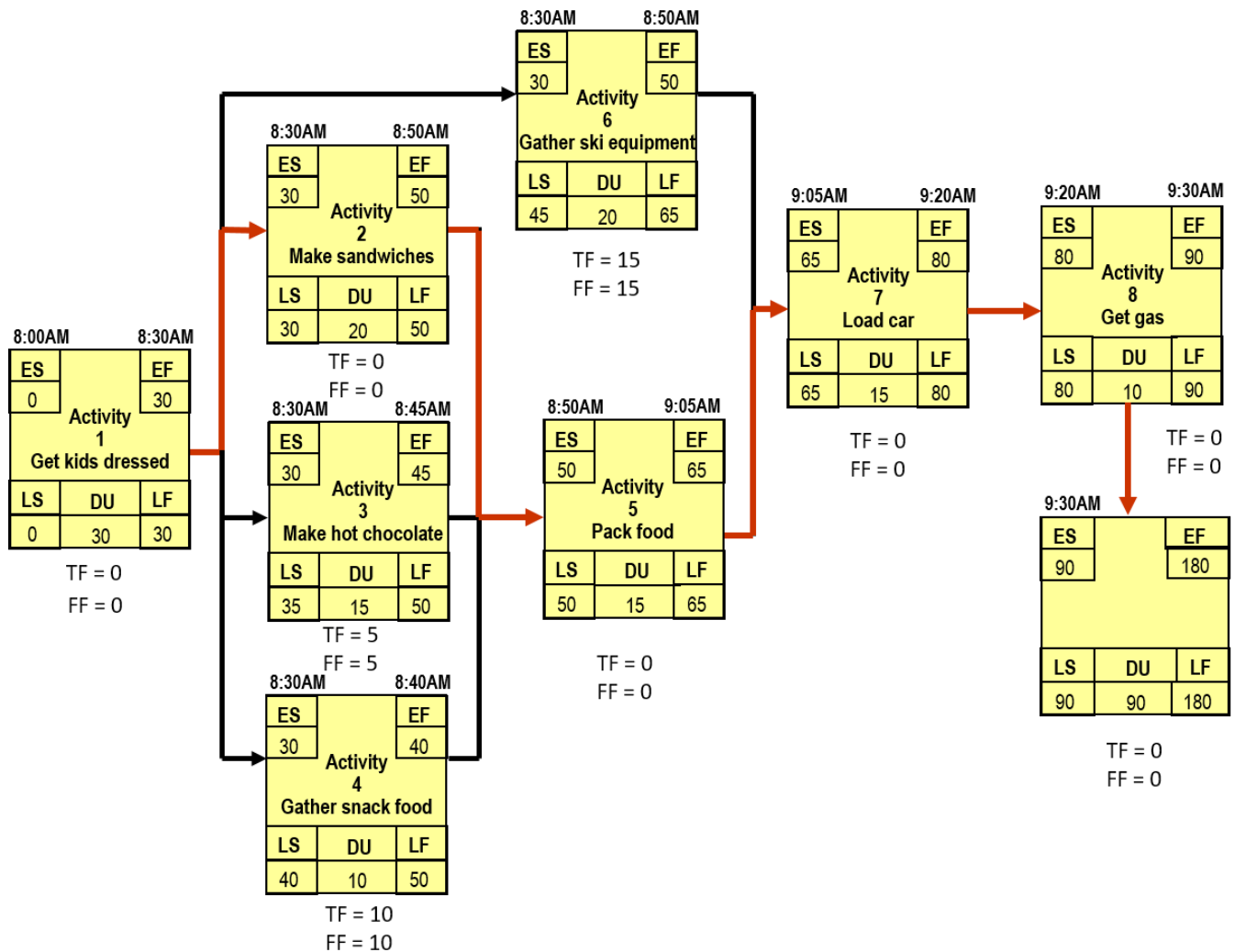
Activity	Optimistic	Most Likely	Pessimistic	Three-Point Estimate
100	3	6	10	6.17
200	3	4	6	4.17
300	7	10	12	9.83
400	3	5	9	5.33
500	1	2	4	2.17
600	4	5	9	5.5
700	3	4	7	4.33
800	7	12	15	11.67
900	3	6	10	6.17

TOTAL	34	54	82	55.33
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Office Relocation PDM



ACTIVITY 6.3 – Ski Trip - Precedence Diagram Method - ANSWER



Activity 7.1 Develop Cost Estimates

ACTIVITY	BUDGETED COSTS	Basis of Estimate
Relocation Design	\$ 29,000	15%
Create Drawings	\$ 3,500	15%
Place Vendor Order	\$ 50,600	10%
Order Processing	\$ 1,000	15%
Vendor Manufacturing	\$ 3,000	15%
Freight Transport	\$ 3,000	10%
Site Prep	\$ 31,800	15%
Data & Electrical	\$ 4,500	10%
Furniture delivery	\$ 59,000	10% to 15%
Furniture Install	\$ 26,000	15%
Punch list	\$ 2,000	15%
Customer Occupancy	\$ 8,900	10% to 15%

Activity 7.2 Cost Baseline – Possible Solution

Activity	Budgeted Cost \$K	JAN	FEB	MAR	APRIL	MAY	JUNE
Relocation Design	\$ 29,000	\$25,000	\$4,000				
Create Drawings	\$ 3,500		\$3,500				
Place Vendor Order	\$ 50,600		\$50,000	\$600			
Order Processing	\$ 1,000			\$1,000			
Vendor Manufacturing	\$ 3,000			\$1,500	\$1,500		
Freight Transport	\$ 3,000					\$3,000	
Site Prep	\$ 31,800		\$1,800	\$30,000			
Data & Electrical	\$ 4,500			\$4,500			
Furniture delivery	\$ 59,000					\$59,000	
Furniture Install	\$ 26,000					\$26,000	
Punch list	\$ 2,000						\$2,000
Customer Occupancy	\$ 8,900						\$8,900
Total	\$222,300	\$25,000	\$59,300	\$37,600	\$1,500	\$88,000	\$10,900
Cumulative Costs		\$25,000	\$84,300	\$121,900	\$123,400	\$211,400	\$222,300

Earned Value Exercise – ANSWER

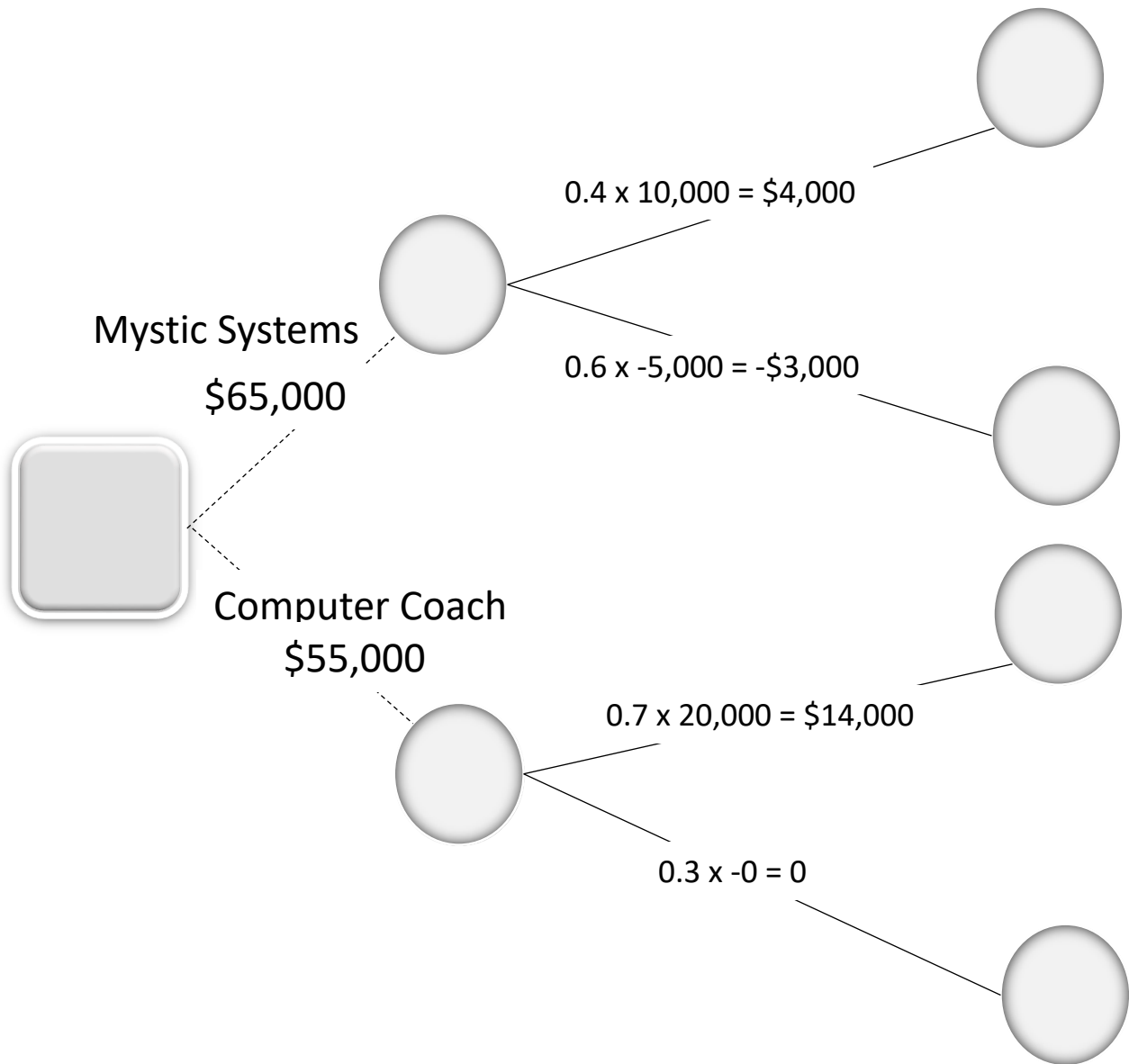
Determine the status of each case (i.e., Over budget, under budget, behind schedule, ahead of schedule, etc.)

CASE	PLANNED VALUE	ACTUAL COSTS	EARNED VALUE	COST STATUS?	SCHEDULE STATUS?
1	1,000	1,000	1,000	On target	On target
2	1,000	600	500	Over budget	Behind schedule
3	1,000	500	600	Under budget	Behind schedule
4	1,000	700	700	On target	Behind schedule
5	1,000	1,000	600	Over budget	Behind schedule
6	1,000	1,000	1,200	Under budget	Ahead of schedule
7	1,000	1,200	1,200	On target	Ahead of schedule
8	1,000	600	1,000	Under budget	On target
9	1,000	1,400	1,200	Over budget	Ahead of schedule
10	1,000	1,200	1,400	Under budget	Ahead of schedule

DECISION TREE ANSWER

Mystic Systems: $65,000 + 4,000 - 3,000 = \$66,000$

Computer Coach: $55,000 + 14,000 - 0 = \$69,000$



Supporting Materials

A Zipped File containing the Digital Appendix (electronic copies of selected support materials)

may be found at:

<http://downloads.interfacett.com/files/pmpc6/appendix.zip>

Project Management Institute

Individual Membership	\$139/year \$129/year renewal
Student Membership	\$42/year \$32/year renewal
Retiree Membership	\$65/year \$65/year renewal
Airmail Publication delivery	\$60/year (outside continental US)
Phoenix Chapter fees	\$30/year
Tucson Chapter fees	\$20/year

Certification exam fees

CAPM	\$235	member
	\$300	non-member
CAPM Re-exam	\$150	member
	\$200	non-member

Credential renewal – full fees – every five years the credential holder must retake the exam

CAPM 135 exam questions, plus 15 ‘pre-test’ questions – total 150 questions in 3 hour timed exam

PMP	\$405	member
	\$555	non-member
PMP re-exam	\$250	member
	\$400	non-member
Re-exam	\$275	member
	\$375	non-member
	\$150	member – Paper fee if great distance from nearest test center
	\$300	non-member Paper fee

Credential renewal	\$60	member/each 3 years
	\$150	non-member each 3 years

Exam details	Initiating	13%
	Planning	24%
	Executing	30%
	Monitoring/Controlling	25%
	Closing	<u>8%</u>
		100%

Cancel/reschedule fee	\$70	if 3-30 days before exam
	Free	if >30 days
	Forfeit	if 1 or 2 days and cannot/do not select a reschedule date

Application Preparation Spreadsheet

PMPC Application Preparation

Notes: Hour limit and Calculated Hours are calculated fields - do not change them.
 Start and End Date is mm/dd/yy format.
 Hour limit estimates working hours in given time period.
 Totals Hours: input your estimated project effort.
 Calculated hours summarizes the 5 process hours for comparison to Total hours.
 Manually input your hours for each process area.

Project Title	Start Date	End Date	Hour limit	Total Hours	Calculated Hours	Initiating	Planning	Executing	Controlling	Closing
My Favorite Project	1/1/09	4/1/09	514	315	300	25	100	100	50	25
			0		0					
			0		0					
			0		0					
			0		0					

Overlapping Project Example

PMPC Application Preparation

Notes: Hour limit and Calculated Hours are calculated fields - do not change them.
 Start and End Date is mm/dd/yy format.
 Hour limit estimates working hours in given time period.
 Totals Hours: input your estimated project effort.
 Calculated hours summarizes the 5 process hours for comparison to Total hours.
 Manually input your hours for each process area.

Project Title	Start Date	End Date	Hour limit	Total Hours	Calculated Hours	Initiating	Planning	Executing	Controlling	Closing
New accounting software	10/1/08	7/1/10	3646	2816	2815	84	563	1464	422	282
Overlap	3/1/10	7/1/10	(697)							
Client data migration	3/1/10	8/1/11	2960	2304	2304	115	461	922	576	230
Overlap	6/1/11	8/1/11	(349)							
Payroll integration	6/1/11	3/15/12	1646	1440	1440	720	720			
			0		0					
Total Sums			7206	6560	6559					
			0		0					

Exam Formula Sheet *(Sample)*

Earned Value Formulas

BAC = Budget at Completion
AC = Actual Cost of the Work Performed
EV = Earned Value
PV = Planned Value
ES = Earned Schedule (Agile)
AT = Actual Time (Agile)

CV = Cost Variance
CPI = Cost Performance Index
SV = Schedule Variance
SPI = Schedule Performance Index

Cost and Schedule Formulas

$EV = \%complete \times BAC$
 $CV = EV - AC$
 $SV = EV - PV$
 $CPI = EV / AC$
 $SPI = EV / PV$

$SV (agile) = ES - AT$
 $SPI (agile) = ES / AT$

Forecasting Formulas = EAC

Making a new estimate: $EAC = AC + ETC$
 (atypical variances): $EAC = AC + BAC - EV$ **or**
 $EAC = BAC - CV$
 (typical variances): $EAC = BAC / CPI$

Estimate to Completion (ETC)

(atypical variances): $ETC = BAC - EV$
 (typical variances): $ETC = (BAC - EV) / CPI$

To-Complete Performance Index

$TCPI(BAC) = (BAC - EV) / (BAC - AC)$
 $TCPI(EAC) = (BAC - EV) / (EAC - AC)$

Variance at Completion

$VAC = BAC - EAC$

Total Float = $LS - ES$ or $LF - EF$

Free Float = ES of next activity - EF of present activity

ES		EF
LS	D	LF

Quality Formulas (Normal Distribution)

± 1 sigma = 68.26%
 ± 2 sigma = 95.46%
 ± 3 sigma = 99.73%

Formulas for Activity Duration Estimating

Three Point Average = $(P + O + ML) / 3$

PERT Three Point estimate =
 $(P + 4 * ML + O) / 6$

P = pessimistic estimate
 O = optimistic estimate
 ML = most likely estimate.

Communication Channels = $(N * (N - 1)) / 2$
 [where N is the number of parties]

Word and Concept Review List

Module 1 Review

Project Management Body of Knowledge (the PMBOK Guide®)

Needs

Project Management

Project

Program

Portfolio

Project Governance

Project Management Office (PMO) and PO

Competencies: Knowledge, Performance, Personal

Leadership versus Management

Process Groups: IPECaC

Phases

Administrative Closure and Final Administrative Closure

Project Life Cycle

Monitoring & Control is NOT a Phase

Lessons Learned

Lessons Learned Register

Retrospectives

Ten Knowledge Areas

ITTO

Tailoring

Objectives

Purpose = change

Perception

Change Intelligence

Module 2 Review

Stakeholder

Stakeholder Register

Brainstorming

Brainwriting

Questionnaires

Surveys

Expert Judgement

Commitment versus Compliance

S.C.A.R.F.

Interest versus Power

Saliency Model
Stakeholder Register
Core Team
Engagement
S.E.A.M.

Module 3 Review

Triple Constraint
Scope
Schedule
Cost
Quality
Project Life-Cycles
 Predictive
 Cascade, Waterfall
 Incremental
 Phase, Stage, Release
 Iterative
 Spiral
 Adaptive
 Agile
 Scrum/Sprint
 Product Owner
 User Story/Stories
 Epic
 Backlog
 Release
 Standup
 Retrospective
 Lean
 Kanban
 I.N.V.E.S.T.
 Formal Signoff
 Timeboxed
 Burndown
 BurnUp
 Scaled Agile: SAFe, LeSS, DaD, Nexus, XP
Product Life-Cycle
Business Analysis
Business Analysis Cycle
 Needs Assessment
 BA Planning

Elicitation and Analysis

Traceability

Evaluation (Value)

Progressive Elaboration

PEST (PESTLE)

Business Case

Benefits Management Plan

Agreements

Project Charter

Enterprise Environmental Factors (EEF)

Organizational Process Assets (OPA)

Project Management Plan

Decision Making

Unanimity

Majority

Plurality

Dictatorship

Voting

Multi-voting

Multi-Criteria Decisions

S.M.A.R.T.

Group Creativity Techniques

Brainstorming

Nominal Group Technique

Idea/Mind Mapping

Affinity Diagram

Focus Group

Facilitated Workshops

Joint Application Development (JAD)

Rapid Prototyping

Quality Function Deployment (QFD) & Voice of the Customer (VOC)

Prioritization

MoSCoW

Multi-voting

Time Boxing

Weighted Ranking

Qualitative

Requirements Management Plan

Traceability Matrix

Module 4 Review

Resource Management Plan

Project Resources
Responsibility Assignment Matrix
RACI Diagram
Hierarchical Diagrams
Text-Oriented Formats
Organizational Structures
Organizational Theory
Functional organization
Matrix organization
Projectized organization
Hybrid organization
Projectitus
Project Manager Authority
Forms of Power
Team Charter
Top-Down Estimating
Analogous Estimating
Parametric Estimating
Three-point Estimating
 Average
 “PERT”
Bottom-Up Estimating
Effort vs Duration vs Elapsed Time
Rough Order of Magnitude (ROM)
Range of Estimate
Approximate Estimate
Definitive Estimate
Phased or “Rolling Wave” Estimate
Resource Breakdown Structure (RBS)
Negotiating
Pre-assignment
Virtual Teams
Colocation
Acquisition
Virtual Teams
Colocation
Taylorism
Maslow’s Hierarchy of Needs
McGregor Theory X and Y
Herzberg 2-factor (Hygiene) theory
Five Stages of Team Development (Tuckman Ladder)
Team building
Reward and Recognition

Training
Conflict
Conflict Management
Confrontation
Blake-Mouton
Emotional Intelligence
Problem Solving

Module 5 Review

Project scope
Project Scope Statement
Scope Creep
Delphi Technique (once a part of Alternatives Analysis)
Product Analysis
Reverse/Value Engineering
Value Analysis
WBS
Work Package
“8-80 hour rule of thumb”
Decomposition
Code of Accounts
Control Account
WBS Dictionary
Scope Baseline

Module 6 Review

Schedule management
Schedule management plan
Activity (verb-noun)
Decomposition
Activity List
Activity attributes
Milestones
Schedule terminology: method, tool, model
Milestone (Master) schedule
Gantt chart
Project target schedule
Arrow diagramming method
Chain method
Precedence Diagramming method
Critical Path method

Hammock

Hard logic

Precedence Relationships: SS, FF, FS, SF

Lag, Lead

Basis of Estimates

Reserve Analysis

Contingency

Forward Pass/ Backward Pass

Float – Total Float and Free Float

Near Critical Path

Agile Schedule approaches

Leveling resources – done manually

Fast Track & Crash

Schedule Baseline

Module 7 Review

Cost management plan

Activity Contingency reserve

Contingency reserve

Cost baseline

Management reserve

Project budget

Funding

Expenditures

Cost baseline

S-Curve (cumulative cost curve, aggregate cost curve)

Crash table

Crash plot

Module 8 Review

Earned Value management (EVM)

Planned Value (PV)

Actual Cost (AC)

Budget at Completion (BAC)

Earned Value (EV)

Percentage Complete (%Complete)

Cost Variance (CV)

Schedule Variance (SV)

Cost Performance Index (CPI)

Schedule Performance Index (SPI)

Estimate at Completion (EAC)

Estimate to Complete (ETC)
Variance at Completion (VAC)
To-Complete Performance Index (TCPI)
Earned Schedule (ES)
Actual Time (AT)
Variance Analysis

Module 9 Review

Quality management plan
Quality metrics
Benchmarking
Standards and Regulations
ISO 9000
Cost of Quality (before, during, after)
 Conformance versus Non-conformance
Total Quality Management
 Deming – Continuous Process Improvement
 Juran – Breakthrough Improvement
 Bill Smith – Six Sigma
 Armand Feigenbaum – TQM
 Shewart
 Malcom Baldrige
 OPM3
 CMMI
Flowcharts (data representation)
Logical Data Model
Matrix Diagrams (note some change!)
Mind Mapping
Pareto Diagram (80-20 rule)
Checksheets and Checklists
Affinity Diagram
Root cause
 Cause & Effect diagrams
Histograms
Scatter diagrams
Quality Audit
Design for X (*Not* DoE)
Quality Improvement
 Deming
 Six-sigma
Statistical sampling
 Attribute versus Variable

Control Charts

Module 10 Review

Communication Management Plan

Communication Requirements Analysis

Communication Technology

Communication Methods

Encode, Transmit, Decode, Acknowledge, Feedback/Response

Cross-culture communication model

Sender/Receiver

Interactive, Push, Pull

THINK

Written Communications

Communication Channels $[N \times (N-1)]/2$

Communication competence

Interpersonal Skills

Active listening

Building trust/candor

Networking

OPA Updates

Module 11 Review

Risk management plan

Defined Risk – risk event, probability and impact

Probability X Impact = Expected Monetary Value (EMV)

Probability scale (0-1 or 0% to 100%)

Spectrum of response

Levels of uncertainty

Known-knowns, known-unknowns, unknown-unknowns

Risk response techniques

Threats: Elevation, Avoidance, Mitigation, Transference, Acceptance

Opportunities: Elevation, Exploitation, Enhancement, Sharing, Acceptance

Acceptance – passive and active

Risk Appetite, Tolerance, Threshold

Risk Breakdown structure (RBS)

Risk Distributions

Risk Impact Scales

Ranged Impact Scale

SWOT

Document Analysis

Prompt Lists

- PESTLE
- TECOP
- VUCA
- Five Whys
- General Lists

- Risk Register
- Risk Report
- Risk Identification
- Risk Owner
- Probability/Impact Risk Rating Matrix (Risk Matrix)
- Bubble chart (2d Representation of 3d factors)
- Modeling & Simulation
- Sensitivity Analysis
 - Tornado diagram
- Decision Trees
- Influence Diagrams
- Contingency and Reserves
- Fallback plan
- Risk Response Audits

Module 12 Review

- Procurement Management Plan
- Procurement Delivery
- Data Analysis
 - Make vs Buy
 - Pay Back Period (PBP)
 - Return on Investment (ROI)
 - Internal Rate of Return (IRR)
 - Net Present Value (NPV)
 - Benefit/Cost Analysis (BCA)
- Contract types
 - Firm Fixed Price (FFP)
 - Fixed Price Incentive Fee (FPIF, aka Fixed Price Incentive or FPI)
 - Fixed Price with Economic Price Adjustment (FP-EPA)
 - Cost Plus Award Fee (CPAF)
 - Cost Plus Incentive Fee (CPIF)
 - Cost Plus Fixed Fee (CPFF)
 - Cost Plus Percentage Cost (CPPC)
 - Time and Materials
- Procurement Documents: RFQ, RFP, IFB, RFI
- Source Selection Criteria
- Source Selection Analysis

Procurement Statement of Work
Bidder Conference
Contract Administrator
Contract Change Requests: Administrative, modification, supplements, constructive change, termination
Procurement Audit
Closed Procurements
Records Management System

Module 13 Review

PMIS
Work Performance information
Effective Meetings
Knowledge Management
 Explicit
 Tacit
Information Management
Data Analysis
 Document Analysis
 Regression Analysis
 Trend Analysis
 Variance Analysis
Integrated Change Control
 Change control
 CCB
 Configuration Control
Verify versus Validate
 Scope Verification
 Product Validation

Module 14 Review

Administrative Closure
Archives
Closeout meetings
Project cancellation
Sunk Costs

Good to Great and Project Management Parallels
Steven Fullmer
Staff Instructor, Interface Technical Training

Good to Great by Jim Collins (Harper Business, 2001) provides a statistical analysis of the characteristics that enable a good company to shift or change toward sustained greatness. Several of the characteristics might be directly correlated to some of the concepts and tools of project management as promoted by the Project Management Institute (<http://www.pmi.org>). PMI espouses an over-arching concept of strategic portfolios, program management that oversees best practices, and projects that address temporary and unique needs. The total concept is more likely a better overlay for concepts addressed in the book, nevertheless there is a direct relationship between book revelations and the foundational structure and tools of project management as documented in *A guide to the Project Management Body of Knowledge, 5th Edition*.

The following table highlights some of the parallels as introductions to further analysis or discussion.

Good to Great	Project Management
Level 5 Leaders	Leadership as vision versus management as task; Motivational theory – Self Actualization, Theory Y
Who is on the Bus?	Projectized teams and approaches Team selection
Confront the Brutal Facts	Quality: metrics, cost of quality
Hedgehog Concept – Three Circles	Needs vs. wants, Triple Constraint; Procurement; Metrics
The Council	The Core Team; project governance
The Flywheel	Process groups; Plan-Do-Check-Act cycle of continuous improvement

Offering a few preliminary comparisons:

Level Five leadership consists of a paradoxical blend of leadership humility and professional will. In other words a clear and driven vision that sets the course and example rather than dictating efforts. Current project management philosophy suggests that project managers become leaders and coaches rather than merely managing the completion of tasks. The concept of monitoring and controlling recognizes that optimal guidance occurs in monitoring mode. Control efforts occur above the work package level, and are most effective when they assure the proper distribution of resources toward the people contributing the work. Truest leadership is “above” the work only in so far as it attempts to maintain a big picture of the aggregate effort. One analogy might that of a forest ranger who climbs the tower to survey the landscape, returning to ground level to affect day-to-day guidance through interaction with both the environment and the customer.

‘Who is on the bus?’ emphasizes the importance of incorporating people with the best possible skill sets (and only the best, letting others off the bus). Project teams focus on putting together an efficient, focused team with the best skill sets to address a specific, targeted effort. The best estimating is performed by identifying subject matter experts, and the best experts are always the work package owners themselves. Work package estimation is both the most accurate and gains commitment toward achievement of the goal.

Confronting the brutal facts includes leading with questions rather than answers, engaging in dialog and debate rather than coercion, conducting autopsies without blame, and creating red flag indicators. The Quality

management knowledge area lies at the core of the triple constraint, with related tools spreading out across all the other knowledge areas. Quality is not only about measurement, but also about selecting the most appropriate metrics (measurement systems) to assure customer needs are satisfied. Cost of quality reminds project managers of the critical value of full and detailed analysis – understanding all the requirements and selecting those most important to complete a properly constrained scope. The cost of quality proposes applying analysis before, during and after execution. The cost of conformance is always higher during and after execution.

The Hedgehog concept, at the core of *Good to Great*, includes the concept of discovering the correct denominator. At the core of the triple constraint we place Quality, the most important element of which is identifying the appropriate metrics by which to measure satisfaction of the customer's needs. When the triple constraint is too large, quality drifts toward one or another of the sides of the triangle (scope, time, or cost) causing focus, profitability, or delivery to miss the mark. When the triple constraint is not carefully planned – through care inspection and introspection, it might be too small and the opportunity to deliver the best quality is lost. Another element of the Hedgehog concept is taking the time to understand and to plan how to best advantage the lessons learned from the planning. Effectively project management is helping the customer to clearly define needs, rather than merely addressing transitive wants.

A project approach applies the use of tools that provide organization within an environment of chaos (entropy and constant change). Decomposition allows project teams to break the work into efforts (called work packages) assigned to specific individuals, while retaining the relationship between the deliverables. Progress is accomplished by a series of related efforts. The critical path enables the project manager to focus efforts on the most essential sequence of activities. Project management is about the tools. Leadership style guides their application.

Not all members of the project affect project plans and oversight. The PMBOK® promotes the use of a core team, consisting of no more than six to eight members. The core team works with the project manager, helping to govern both the vision and direction of the project. The project core team and the Council concept are direct parallels.

Regardless of whether a project is longer term (predictive), iterative or incremental, or totally adaptive (e.g. Agile methodology) the tools are the same. Project success is predicated upon the concept of planning and executing, overseen by monitoring and controlling to affect continuous improvement (Deming's plan-do-check-act). The goal is constant, small course corrections toward a carefully planned, fixed goal. This appears to be a direct correlation to the concept of the flywheel guiding through Buildup to Breakthrough.

A common dismissal of the findings that Jim Collin's shares in *Good to Great* is the lack implementation methodology. The established tools of project management may serve to fill some of that need.

Getting ready for the PMP Exam: Rent/Lease versus Buy

Steven Fullmer, PMP

Staff Instructor, Interface Technical Training

In a recent blog, I addressed relative procurement risk and the selection of contract types. Within that blog I compared the initiation of procurement with the initiation of a project. In our [PMPC preparation course](http://www.interfacett.com/training/project-management/pmpc-pmp-project-management-fundamentals-and-professional-certification) [http://www.interfacett.com/training/project-management/pmpc-pmp-project-management-fundamentals-and-professional-certification], I regularly emphasize the integration with other knowledge areas and insight that procurement is equivalent to a sub-project. The make-buy decision preceding procurement is equivalent to the cost-benefit analysis that precedes creation of a project charter. In addition to the make-buy decision, you may also be asked to calculate results for a rent (or lease) versus buy decision. Although not specifically identified within A Guide to the Project Management Body of Knowledge 5th Edition®, financial and business calculations are returning to the realm of test worthy content.

You might relate the rent versus buy decision to the Business Analyst's use of net present value or internal rate of return to determine which projects within a portfolio generate the most financial promise of return. Both net present value, as represented by the following two equations, and Internal Rate of Return were regularly represented on the PMPC® exam until the 4th edition of the PMBOK®.

Net Present Value

$$NPV = -Principal + \sum_{i=1}^n \frac{payment_i}{(1 + rate)^i}$$

$$PV = FV / (1 + i)^n \quad \text{or}$$

In the first equation, **PV** is present value, **FV** is future value, **I** is the interest rate per period, and **n** is the number of periods.

In the second equation, NPV or net present value is the difference between current principal and the sum of payments over a period of time. The sum of the payments is calculated by dividing the payment amount per period by one plus the interest rate to the power of the number of periods.

Internal Rate of Return

Internal rate of return is merely the interest rate that makes the Net Present Value of an investment over time equal to zero.

The use of Internal Rate of Return (IRR) for business decisions is typically the selection of any project whose Internal Rate of Return exceeds a specific threshold. If, for instance, the company's IRR on its investments is 12% then any project with a rate of return greater than 12% would yield positive revenue.

This would enable the prioritization and selection of projects within a portfolio to justify assignment and creation of a Project Charter.

Both Net Present Value and Internal Rate of Return are related to the time value of money and compounding of interest.

The rent versus buy decision is similar in nature, though for the purpose of the PMP® exam you do not need to take into account compounding.

To be comprehensive, you should consider the total Product Life-Cycle cost of the item being leased or purchased. This would include design, build, operations, support and disposal. For comparison purposes on the exam, you only consider build and operations cost. For a rented or leased item, the cost of the item and operations is covered by the seller (lease provider). For a purchased item, both purchase cost and operations cost must be totaled for an accurate comparison.

As a result, when the cost to rent or lease equals the cost to purchase and operate, the choice is at equilibrium. You need to know how long you actually need the item to determine equilibrium. Remember that projects are temporary and unique. So you would typically want to lease if the rental cost times the number of rental days is less than the purchase price plus operations cost per day.

An equation for the comparison would be:

$$(\text{Rental cost per day}) * \text{number of days} = \text{purchase cost} + ((\text{daily operations cost}) * \text{number of days})$$

If you understand the concept, you should be able to tackle most questions on the exam without significant math.

Aileen Ellis' book entitled ***“How to get every Contract Calculation question right on the PMP® Exam”*** covers calculations for all the contract types in detail, including 50 sample questions. Although the book focused on calculation of contract terms and values, some of her examples include rent versus buy decisions. The book is available in print or e-book format from Amazon.com for a nominal cost. [Here is a link to the print copy.](#) [Here is a link to the e-book.](#)

Good luck with your exam prep!

I hope to see you in the classroom or online.

Getting ready for the PMP Exam: Contract Risk
Steven Fullmer, MBA, PMP, PMI-PBA, CQ
Staff Instructor, Interface Technical Training

My students regularly identify four areas with significant question volume on the PMP® exam: schedule diagrams, earned value management, risk calculation, and procurement. This feedback may reflect the preponderance of mathematics in the first three topics. Project Procurement Management crosses four of the five process groups identified in A Guide to the Project Management Body of Knowledge 5th Edition®. This creates the opportunity for questions across the process groups rather than heavily within a single process group (usually the Planning Process Group). Historically, procurement management has been light on mathematics. Indeed, there are no equations or graphical representations in Chapter 12- Project Procurement Management of the PMBOK®.

In our PMPC preparation course [<http://www.interfacett.com/training/project-management/pmpe-pmp-project-management-fundamentals-and-professional-certification>], I regularly emphasize the integration with other knowledge areas and insight that procurement is equivalent to a sub-project. Procurement is effectively the establishment of a micro project with the make-buy decision preceding procurement equivalent to the cost-benefit analysis that precedes creation of our project charter. The project manager, purchasing agent, or contract administrator becomes the sponsor while the seller's representative serves as the project manager. The output of the procurement is a product or service, a subset of our project's overall deliverables. Comparisons and contrasts between projects and procurement enable PMI to evaluate the candidate's ability to comprehend knowledge area integration.

An understanding of risk is most directly associated with the selection or development of contractual relationships within Procurement Management. The selection of contract type correlates closely to the continuum from risk avoidance, through risk mitigation toward risk acceptance.

If we clearly understand project needs and can specify them objectively (knowns), we can place the risk upon the seller. When the nature of the work is less well understood (unknown-unknown), we may be guided to negotiate a time and materials contract that places more of the risk on the buyer whom we represent. Cost-reimbursable contracts fall within the spectrum between fixed price and time-and-materials options, closely related to mitigation or transference (known-unknowns).

The PMBOK 6th edition® offers options within each contract type that provide a risk continuum which the exam candidate must understand. The list of contract options from least risk for the buyer (project) to most risk for the buyer are:

- Firm Fixed Price (FFP)
- Fixed Price Incentive Fee (FPIF, aka Fixed Price Incentive or FPI)
- Fixed Price with Economic Price Adjustment (FP-EPA)
- Cost Plus Award Fee (CPAF)
- Cost Plus Incentive Fee (CPIF)
- Cost Plus Fixed Fee (CPFF)
- Cost Plus Percentage Cost (CPPC)
- Time and Materials

It must be noted that the terms of a Time and Materials contract may place it higher in the risk order, though it is generally considered the highest risk for the buyer unless clear constraints are identified.

I will provide insight into each of the contract types, though you will first need a few terms that are not defined in the PMBOK®. You may see each, or even all of the terms, and associated values on any given exam contract question. Understanding their context will enable you to better answer related questions.

Target Cost: The cost that you (as the buyer) have determined matches the value you need for the work to be provided.

Target Fee/Target Profit: The compensation that you are willing to provide the seller in exchange for product or services. The target fee is typically determined as a portion of the target cost. The target fee might be initially set as a fixed amount or as a percentage of your estimate of the value of the work.

Target Price: The sum of the Target Cost and the Target Fee. Note the possibility of confusing the difference between Target Cost and Target Price based on the contract type. For instance, with a Firm Fixed Price Contract, the Target Cost and the Target Price may be the same.

Share Ratio: A ratio representing the percentage risk assumed by each party, noted as NN/NN where the first NN value represents that risk assumed by the buyer (you) and the second NN value represents the risk assumed by the seller. For example 10/90 would identify that you (buyer) assume only 10% of any risk experienced while the seller assumes 90% of the cost of the risk. The use of the share ratio may be the most confusing of the terms. A higher share ratio for the buyer DOES NOT MEAN that the contract type is a higher risk. Pay attention to the list above to determine which contract type affords the greatest risk avoidance or risk acceptance. The share ratio is used to determine seller compensation relative to contract type and in conjunction with the Target Fee or Target Profit range assigned to the contract. Once a contract type is selected, the share ratio helps to determine the terms relative to the Target Fee and does not change the nature of the contract. For instance, in an incentive based contract, the seller percentage may be as low as 5% or 10%, and this would affect a share ratio something like 95/5 or 90/10.

Ceiling Price: The maximum amount you are willing to pay. This term is more typically applied to Cost Plus contracts, where the actual costs may push the payment above the Target Cost or even above the Target Price if initial estimates are incorrect. Once the Share Ratio starts to apply to compensation calculations for a Cost Plus contract, the Ceiling Price represents the maximum price that you will pay. Ceiling price protects the buyer.

Maximum Fee and Minimum Fee: Though not used on all contract types, these values would represent the maximum and minimum compensation for the seller regardless of the seller's ability to significantly over or under perform contract terms. Once the share ratio applies, maximum fees protect the buyer and minimum fees protect the seller. These fees typically apply to Cost Plus contracts.

Now, let us look at each contract type based upon the terms and their relationships. The PMP exam may ask you to calculate actual payments fees or total payments based upon these concepts, which may be the

topic of a later blog. In the interim, Aileen Ellis has a great little book entitled ***“How to get every Contract Calculation question right on the PMP® Exam”*** that covers the calculations in detail and provides 50 sample questions. The book is available in print or e-book format from Amazon.com for a nominal cost. [Here is a link to the print copy.](#) [Here is a link to the e-book.](#)

Firm Fixed Price

The seller bears all the risk and performs the contracted work as identified in the Statement of Work. The share ratio for this contract type is 0/100. The cost of the work is the Target price, regardless of any over or under runs by the seller.

Fixed Price Plus Incentive

The seller performs the work, bearing the risk of the project. The share ratio is used if the seller under-runs the cost of the work, as a means to determine how much more than the target fee the seller will earn for outperforming the goal. Note that the share ratio might appear in favor of the seller, for instance 80/20. This does NOT necessarily suggest that the buyer (you) are assuming more risk. The share ratio is used to determine how much of the overrun the seller will be penalized or how much of the under-run margin the seller will receive in addition to their target fee or target profit. Using my 80/20 example: If there is an overrun, the seller would be penalized 20% of the overrun against the Target Fee, and the Ceiling Price would not be exceeded. If there is an under run, the seller would receive 20% of the under run added to their Target Fee as an incentive, effectively increasing their profit up to the Maximum Fee.

Fixed Price Plus Economic Price Adjustment

This form of contract typically occurs when elements of the service or product deliverables are subject to market volatility. This is more common for longer term contracts that would be subject to market based price changes. Although within the fixed price category, the Ceiling price is not fixed except for items within the contract that are determined NOT to be affected by market rates. For example, the production of good might be fixed, but the cost of transportation and delivery might be locked relative to market fuel and labor rates. The Statement of Work would clearly identify the specifications for the product, as well as which items might be considered to vary with the market. In other words, the Statement of Work would not be open ended as might occur with a Cost Plus or Time and Materials SOW.

Cost Plus Award Fee

For this and the other Cost Plus contracts, payment of Target Fees or Profit are added to the actual cost of the Product or Service, and a Ceiling Cost is unlikely to be stated. The Target Price therefore varies based on the actual cost of the work performed or product that is delivered. There is usually a Base Fee that equates to the Target Fee as a percentage of the overall Target Cost. The buyer (customer/project) UNILATERALLY determines an additional Award Fee amount that may be paid periodically or as a lump sum if the seller performs better than Target Cost or under runs the Cost. This form of contract requires

an Award Fee Plan that determines how awards will be calculated and awarded whether periodically or over a specified time period.

Cost Plus Incentive Fee

Incentives are provided to the seller relative to the actual Cost rather than relative to the Target Cost. In this instance, the buyer bears more of the risk since there is no Ceiling Price. The actual price of the contract becomes a combination of the actual cost plus the compensation provided to the seller. The maximum price, should there be an overrun of the Target Price, would be a combination of the Actual Cost plus the Minimum Fee paid to the seller. The minimum cost would occur should the seller under run the cost sufficient to achieve their Maximum Fee, which would be added to the actual (lowest cost) to create the Actual Price paid. Between the Minimum Fee and the Maximum Fee, the seller receives the Target Fee plus or minus a percentage of the under run or overrun added to the Cost. For instance, with a Share Ratio of 80/20 and an under run against the target cost, the seller would receive their Target Fee plus 20% of the cost under run, until the Target Fee plus 20% of the under run matched the Maximum Fee. Note that in any case the Fee received by the Seller is added to the Actual Cost, rather than compared to the Target Cost or Ceiling Price as would occur with a Fixed Price contract.

Cost Plus Fixed Fee

Similar to both of the previous two Cost Plus contract types with one major difference: the compensation provided to the seller is not scalable once the contract is negotiated. The Target Fee is determined as a percentage of the Target cost, and then locked as a specific monetary amount. In the case where the seller under runs the target, they are given a fixed amount rather than merely a percentage of the difference. This guarantees the seller a specific income, reducing the seller risk. In the case of a cost overrun, the seller also receives their fee, rather than a reduced payment structure.

Cost Plus Percentage Cost

Although not mentioned in the PMBOK 5th Edition®, it is common for sellers to prefer a contract that assures a fixed percentage profit for work performed. The percentage represents a guaranteed profit margin, regardless of cost. The disadvantage to the buyer includes the consideration that sellers will not strive to reduce the costs, since the higher the Actual Cost, the higher the fee received.

Time and Materials

Within a time and materials contract, the seller may charge the seller any verifiable costs for the project, including business overhead, profit and operating margins. The procurement Statement of Work is typically open ended, allowing the buyer and seller to negotiate changes as the nature of the work is identified. Without a specific closure for deliverables, the costs associated with a Time and Materials contract may run higher than desired by the buyer before a viable product is delivered.

As you prepare for the PMPC exam, or consider the negotiation of a procurement agreement, make sure that you understand the relative risks to the buyer and the seller for each of the options.

An experienced project manager will conduct a Force Field analysis, determining the factors associated with both buyer and seller risk, in the process of selecting the most appropriate contract type.

I hope to see you in the classroom, or online!

GLOSSARY

8-80 Hour Rule	Rule of thumb that suggests work packages should have a duration no more than 80 hours or less than 8 hours.
Benchmarking	Comparing project or business practices to other business's or project practices to improve performance.
Business Case	A document containing the analysis to justify pursuit of a project opportunity
CAPM	Certified Associate in Project Management
Change Control Board	A group of stakeholders responsible of approving or rejecting change requests
Change Management Plan	Documented approach to implementing change control
Core Team	Diverse subset of the project team responsible for initial planning prior to review and approval by other stakeholders
Deming, W. Edwards	Father of the Quality Evolution; Known for continuous process improvement and his Plan-Do-Check-Act approach to improving quality
Design of Experiments	Analytical technique used in quality control to determine which variables have the most influence on the outcome of a process
Expected Monetary Value	Risk management term resulting from risk analysis. Calculated by multiplying probability of occurrence times the dollar impact
Facilitated Workshops	Used to determine customer requirements and details

Fallback Plan	A plan used when the initial risk response plan fails
Functional Analysis	Analysis of the function of each feature in the product or system.
Herzberg, Frederick	Psychologist known for his Motivator-Hygiene Theory of motivation
Integrated Change Control	Involves changes made that impact cost, time, scope, quality or risk.
Ishikawa Diagrams	Also known as Fishbone Diagrams or Cause and Effect Diagrams used in quality control.
ISO Standards	International Standards Organization. A voluntary organization that issues quality standards to member countries. ISO9000 contains Quality Standards and approaches.
Joint Application Development (JAD)	Requirements-gathering technique that include customer involvement
Knowledge Areas	Ten Knowledge Areas from the PMBOK that is part of the project management framework
Major Deliverable	Top level in the work breakdown structure that represent the primary components of the project
Maslow, Abraham	Motivational psychologist known for his Hierarchy of Needs and the term "Self-Actualization".
McGregor, Douglas	Psychologist known for his Theory X and Theory Y for motivation.
Metrics	Components of the project that can be measured and tracked throughout the project life cycle.
Network Diagram	A form of schedule for the project that shows linkages between activities.
Nominal Group Technique	A form of brainstorming that ensures that everyone participates in an exercise.

PgMP	Program Management Professional. A credential of the Project Management Institute.
Phase-End Review	A closing process used at the end of a phase to determine if need is still valid, if the scope is unchanged, and if we have completed the tasks in the phase.
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PMO	Project Management Office
PMP	Project Management Professional - A certification offered by the Project Management Institute.
Procurement Audit	A review of the procurement process upon the completion of a contract with a seller. Used to improve the procurement process.
Procurement Statement of Work	Details what the Seller is to provide the Buyer.
Product Life Cycle	Products live beyond the project. Projects cover research and development/delivery. The costs of operation, maintenance and disposal expend beyond the Project Life Cycle.
Project Budget	Project costs provided in detail. The Cost Baseline.
Project Life Cycle	Collection of sequential project phases
Project Management Framework	Consists of the 5 project management process groups and the ten knowledge areas.
Project Scope Statement	A description of the work required to deliver a product or system to the customer. Includes assumptions, constraints and major deliverables.
Project Statement of Work (SOW)	Description of products or services to be provided to the customer.

Quality Assurance (QA)	A process of continuously evaluating overall project performance to gain confidence that the project will satisfy relevant quality standards and regulations.
Quality Audit	Independent third-party review of the project team's quality management activities. Performed both at scheduled and random points during the project.
Quality Control	Monitoring project results in comparison to specifications, regulations and standards.
Quality Function Deployment	A process to help design team define, design, build and deliver a product or system that meets customer needs.
Rapid Prototyping	Building a sample prototype from preliminary system requirements and showing the customer for comment and input. Performed when the customer can better identify what they do not want than specifications for what they do want.
Requirements Management Plan	Documents how requirements will be analyzed, documented and managed throughout the project.
Risk Enhancement	A risk management strategic response for opportunities to increase the probability of their occurrence.
Risk Exploitation	A risk management strategic response that seeks to eliminate uncertainty by ensuring the opportunity actually happens.
Risk Rating Matrix	This is a Probability and Impact Matrix that supports risk prioritization and determines the Expected Monetary Value for risk ranking.
Risk Response Audit	Third-party independent review of the team's risk response plans, typically performed after a risk response has been completed.
Risk Sharing	Sharing ownership of the risk opportunity with others who are able to capture the benefits. Joint ventures are an example.

SDLC	Systems (or Software) Development Life Cycle used for planning organizational life cycles for projects
Six Sigma	Preventive approach to minimize defects. Six Sigma represents six standard deviations of process distribution containing 99.7% of measurements.
Stakeholders Engagement Analysis Matrix	Defines an approach to show gaps in actual stakeholder support versus desired support throughout the project life cycle.
Stakeholder Register	Contains details of identified stakeholders such as expectations, influence, and interest areas.
Total Quality Management (TQM)	An approach used to achieve continuous improvement in processes and products.
Triple Constraint	Time, Cost and Scope of the project

Case Studies

Project Initiation and Planning

RD Processing, Inc.

RD Processing, Inc. is a firm that provides data processing services to other local businesses. It has been in business for 20 years and has 90 employees. Sixty employees are located in the Big Tower building in an office park in the suburbs of a major city. Forty of these people work on the 5th floor where the firm has been renting space for the past 12 years; the other 20 are on the 9th floor where the company was able to rent additional space as it grew. The people from these two areas see one another in the building cafeteria, but don't really know one another well. Six months ago RD Processing acquired DataHelps, a similar firm, when that firm's owner decided to retire. DataHelps has been in business 10 years, has 30 employees, and is located on the other side of the city in the Green Valley professional building.

Big Tower II, a new office building, was recently completed next to the original Big Tower building. **Marty Alomar**, owner of RD Processing, has an option to rent an entire floor in Big Tower II. This would be enough space to consolidate all 90 employees in one space and still leave some room for growth.

Marty has established a project team of three people, one from each of the current spaces, to come up with a proposed layout for the new building space. **Chris Lindsey**, who works on the 5th floor, is a supervisor and has been with the firm 18 years. **Kelly Tarasco**, who works on the 9th floor, is the firm's computer specialist and has been with the company 5 years. **Pat Nesbitt**, a data processing clerk located in the Green Valley professional building, has worked for DataHelps since it started 10 years ago.

The project team is having its first meeting in the company's conference room on the 5th floor of the Big Tower building... Pat arrives late. It's only Pat's second visit to the Big Tower building and traffic was much heavier than expected. Chris speaks first.

"I pretty much know the work flow and the bottlenecks and have a pretty good idea of how we should lay out the new office space we'll be moving into."

"Are we all really going to move into the new space?" asks Pat.

"Yes," responds Chris abruptly.

Kelly speaks up. "One of my neighbors told me that his company went through similar consolidation and they surveyed all the employees to get their input. Maybe we should do something like that."

"We don't need to waste time doing that," states Chris. "I've been here long enough to know what needs to be done."

"I guess you're right," says Kelly.

Chris continues, "Now let's get to work. I suggest..."

Pat interrupts. "Consolidation? Did I hear you say consolidation? Does that mean that we're going to be downsizing? Is *that* what this is all about? I heard rumors about layoffs when RD Processing acquired DataHelps."

"That's ridiculous!" retorts Chris.

"Layoff? Really?" queries Kelly. "They'll never lay me off, not with my computer skills. They need me too much. Besides I could get another job in a minute."

"We're getting off the topic," interjects Chris. "Can we get to work, or we'll be here all day."

"Wait a minute," interrupts Pat again. "We've got some bigger issues here than some dumb office layout! I'm telling you, none of the people in the Green Valley building want to move to the new building. We like it where we are. We can walk to the shopping mall at lunch, and employees have their kids in the day care center right down the street. And we're going to have to drive an extra 30 minutes to and from work every day. The people might not be able to get to the day care center before it closes at 6 o'clock. I think we have a lot of other problems to solve before we worry about an office layout. Aren't there any alternatives?"

"I'm open" says Kelly.

Chris sighs, looks down, and says matter of factly, "You're making this more complicated than it needs to be. Now, can we please get to the office layout? Isn't that what we're supposed to be doing?"

Questions:

1. Why is Marty considering moving to a new office building?
2. What are some of the advantages and disadvantages of the move?
3. What could Chris, Kelly, and Pat have done differently?
4. Who are the stakeholders?

RD Processing, Inc. – POSSIBLE ANSWERS

Case Questions

1. Why is Marty considering moving to a new office building?

- to consolidate all 90 employees and have space for growth.
- promote interaction of all employees.

2. What are some of the advantages and disadvantages of the move?

Advantages:

- employees get to know each other & share info, ideas, etc.
- all expertise in one place.
- easier to manage.

Disadvantages:

- could be expensive.
- involves lots of coordination, planning & buy-in from employees.
- some don't want to travel across town.
- takes time & productivity could drop during move.
- issues with day care, travel time, location preference, etc.

3. What should Chris, Kelly, and Pat have done differently?

- take a few minutes and chat and get to know one another at the beginning of the mtg.
- discuss the advantages/disadvantages of the move
- reach agreement on how to proceed.

4. Who are the stakeholders?

- Employees
- Landlord
- Customers
- Suppliers
- Day care providers, Mall vendors

Scope Planning

Scope Creep Exercise

The Number One enemy for most Information Technology projects is “*scope creep*” – the gradual accumulation of new or expanded requirements after a project has been approved.

You may have found that even the best gathered system requirements often fall short as you move into the design phase of the project. Unfortunately, many organizations seem surprised by this, as though their analysts and subject matter experts were not only infallible, but psychic as well.

This puts you in an unenviable position, such as the following:

You are leading a highly visible systems project for the Marketing Department. All parties involved in the project definition stage have approved your definition and your original estimates point to a project completion date of October 1st.

Midway through the design phase Marketing decides to add three features that were not included in the original project scope. As it turns out, all three features are critical to the new system, but, according to you and your team, each adds a week to the project’s schedule. What’s more, you discover that your team underestimated one of the original deliverables by 10 calendar days.

The project must be completed by October 15th to meet Marketing’s deadline for a new promotional campaign which depends on the new system. However, your team members are confident that they can catch up, include the underestimated deliverable, and add Marketing’s three new features before October 15th.

At a recent executive committee meeting, the CEO criticized IT for prior cost and schedule overruns. You know that all eyes will be on you and your team as the project progresses.

What will you do in this situation?

Scope Creep Exercise - Answers

Solution:

1. Whatever you do, don't buy into the team's well-meaning, but unrealistic optimism about catching up. After all, your analysis team already underestimated once, who's to think there are no other underestimates lurking ahead?
2. You are looking at about four-and-a-half weeks of additional work on the project. You should be prepared to assume responsibility for the 10 day underestimate and should alert Marketing to be ready to assume responsibility for the three weeks added work for the three new features.
3. To meet the October 15 deadline you should make clear that you need to add additional resources right away, but be specific about what resources are needed. Waiting until the last minute to add resources is too risky for this high visibility project.
4. Offer incentives to your team for completing the project on the original date of October 1st. This will leave room for last-minute additions to the project scope.
5. Negotiate with Marketing to see if they can displace three other planned-for features to accommodate the newest features.

Scope creep inevitably results in additional resource requirements and/or later completion dates. It's a fundamental fact of IT project management life. The key is to manage the changes effectively to meet cost, schedule and scope requirements plus, of course, satisfy the customer!

Human Resources Management

Multi Projects, Inc. (MPI)

MPI is a well-established consulting firm with 400 employees. It has many projects going on simultaneously for various clients. MPI has a good reputation with nearly 30% of its business from prior clients. The firm targets growing companies for future business and has recently been successful. Due to the growth, the challenge is to support current work, keep old clients satisfied, and bend over backward to accommodate new clients. MPI's employment growth has increased 30% over the past two years.

MPI has a matrix organization structure. As new projects come in, a project manager is assigned. One project manager may be assigned to several projects at one time, depending on the size of the project. Projects range from \$50,000 to \$2,000,000 and can be from one month to two years in duration. Most projects are about six months in duration and worth about \$100,000 to \$200,000. The firm performs a range of consulting services, including market research and manufacturing system design. Its clients are medium to large corporations and include banks and manufacturing firms.

MPI got a call from Growin Corporation (Growin), which wants to proceed with a project that MPI proposed nearly six months ago. Partners at MPI are surprised by the good news. They thought the project was dead. They are very interested in this first project for Growin since it is a rapidly growing firm. MPI sees an opportunity for several more projects from Growin in the future.

The Players

Jeff Armstrong is assigned as project manager for the Growin Project. He has been with MPI for about a year and is anxious to get a challenging project to manage. He worked on the Growin Project proposal.

Tyler Bonilla is a senior systems engineer. He has been with MPI for eight years. He has an excellent reputation and previous clients with whom he has worked usually request that he be assigned to their projects. He enjoys his work even though he's extremely busy. He is currently working full-time on a project for Goodold Company, a current client. Goodold said that one of the reasons it does business with MPI rather than with another consulting firm is the great work Tyler does on their projects.

Jennifer Fernandez is the manager of systems engineering. She has been with MPI for about 15 years. Tyler reports to Jennifer, but because of his heavy workload and associated travel, he does not get to see Jennifer very often other than her monthly staff meetings.

Julie Capriolo is the project manager for the Goodold Company project. She has been with MPI for about two years. Tyler is assigned to her project full-time. The project has a tight schedule with everyone putting in extra hours. Julie feels a lot of pressure, but she has a good project team – she relies heavily on Tyler. She had heard from a friend who used to work with Jeff that Jeff is very ambitious and will do whatever it takes to make

himself look good. This had not been of concern to Julie because she and Jeff have separate projects and do not run into each other very often.

The Scenario

The day Jeff is assigned to be project manager on the Growin Project he runs into Tyler in the hallway. “We got the Growin Project,” he tells Tyler.

“Great,” responds Tyler.

Jeff continues, “You know, one of the big reasons they gave the project to us rather than to another consulting firm is because we promised you’d be the lead systems engineer on the project, Tyler. They were impressed with you when we met with them to present our proposal. When do you think you can start work on the project?”

“Unfortunately, I can’t,” Tyler states. “I’m tied up on the Goodold project and things are very hectic. I’ll be on that project for another four months.”

“No way!” exclaims Jeff. “This Growin Project is too important to me – I mean, to us. I’ll take care of it.”

“You’d better talk to Jennifer,” Tyler tells him.

Jeff stops by Jennifer’s office. She’s busy, but he interrupts her. “I gotta have Tyler Bonilla on my Growin Project. He wants to work on it, but he said I should talk to you.”

“That’s impossible,” says Jennifer. “He’s assigned to Julie Capriolo’s Goodold project for the next four months.”

“Julie? Who’s she? Never mind. I’ll find her and work it out. You probably have somebody else you can assign to her project,” replies Jeff as he quickly bolts out of her office in search of Julie.

“That’s my decision, not yours or Julie’s!” shouts Jennifer. But by that time Jeff is gone and does not hear what she said.

Julie is meeting with her project team in the conference room. Jeff knocks on the door and opens it. “Is there a Julie in here?” he asks.

“I’m Julie,” she replies.

“I need to talk to you ASAP. It’s important. Oh, by the way, sorry for interrupting.” Looking toward Tyler, who’s in the meeting, Jeff says, “Hey Tyler, catch you later, buddy, after I talk with Julie.” Jeff shuts the door and goes back to his office. Julie is noticeably disturbed at the interruption.

After her meeting, Julie calls Jeff. "This is Julie. What did you want to talk about that was so urgent?"

"About reassigning Tyler to my project. He's interested and I've already talked to Jennifer about it," answers Jeff.

"That's impossible," declares Julie. "He's critical to the Goodold project."

"Sorry," says Jeff, "but if the Growin Project is successful, we'll get more business from them than we ever got from the Goodold Company."

"It's already after 6 o'clock and I have to be out of town for a week, but I'll discuss this with Jennifer as soon as I get back," snaps Julie.

"Yeah, sure, whatever," responds Jeff.

The next day Jeff calls a meeting with Jennifer and Tyler. He starts by telling them, "I called this meeting to figure how soon Tyler can begin working on the Growin Project and how you (looking toward Jennifer) can get somebody to take his place on what's-her-name's project."

"I think Julie should be here for this discussion," says Jennifer.

"She couldn't make it. Apparently she's out of town for a week, and we need to get going on the Growin Project now," Jeff tells her. "We need to prepare for a meeting with them next week. Besides, Tyler is the one we're talking about, and he'd rather work on the Growin Project. Right, Tyler?"

"Ah, well, now that you've asked, I am getting tired of working on the Goodold projects," replies Tyler. "I'm not learning anything new, I mean, it's okay, but I'd like a change."

Jennifer is astonished. "You never mentioned that to me, Tyler."

Jeff breaks in, "Well, I guess it's settled. Jennifer, you assign somebody else to the Goodold project who'll feel a little more challenged and tell Julie when she gets back. In the meantime, me and my buddy Tyler have got a lot of work to do to look good for our meeting with the Growin people next week."

Questions: Assuming that you are a Program Manager and that Jeff and Julie work for you at MPI:

1. What steps would you suggest be taken to resolve the immediate conflict?

2. What actions would you recommend to avoid this type of conflict from occurring on future projects?

Multi Projects, Inc. (MPI) - ANSWERS

1. What steps would you suggest be taken to resolve the immediate conflict?
 - a. Jennifer should meet with Julie and Tyler to determine Tyler's current workload and potential availability part-time on Jeff's project.
 - b. Consider using Tyler on Jeff's project as needed at critical points.
 - c. Hire a new systems engineer to act as an understudy to Tyler, but assigned to Jeff's project.
 - d. Have Jennifer communicate to all concerned parties the priority of each project for MPI as determined by senior management.

2. What actions would you recommend to avoid this type of conflict from occurring on future projects?
 - a. Provide a process for how project managers are assigned to specific projects.
 - b. Establish a process to rank and prioritize projects.
 - c. Obtain commitment to priorities from senior management.
 - d. Communicate project priorities and corporate strategies to internal stakeholders.

3. How would you coach Jeff to improve his effectiveness in managing relationships with other staff members?
 - a. Inform Jeff of the negative impact he has on his co-workers who he needs to depend on for support.
 - b. Communicate to him the importance of teamwork to his overall success at MPI.
 - c. Meet with Jeff to complete a competency assessment with special emphasis on Team Leadership, Communications and Personal Effectiveness.
 - d. Perform a gap analysis and develop personal goals to improve his job performance level.

4. What steps would you recommend to assure that resource utilization is optimized among multiple projects?
 - a. Negotiate with functional managers for the right skills at the right time on projects.
 - b. Determine when critical skills are needed on specific projects.
 - c. Recruit additional system engineers to support MPI's growth and technical staffing requirements.
 - d. Use portfolio management tools to identify slack time for resources.

5. How would you best utilize Tyler?
 - a. Have Tyler coach new engineers on other projects.
 - b. Make sure that Tyler is recognized and rewarded for his high performance and demand from customers.
 - c. Take care of Tyler or he just might be hired away by a client.
Stranger things have happened!

Quality Management

The LOGON Project

Background

The Standard Industrial Gadgets Company (STING) is a medium-sized engineering and manufacturing firm specializing in warehousing and materials handling systems. STING purchases most of the subsystems and components then modifies and assembles them to satisfy customer requirements.

Every STING system is made to customer specifications and most of the firm's work is in systems design, assembly, installation and service. The firm's 250 employees are roughly divided equally among 5 divisions: Design, Process Engineering, Assembly, Marketing and Customer Service. Recently, competition has forced the firm to expand into computerized warehousing despite the fact that its experience and computer expertise are currently rather limited. STING is considered an industry leader for supplying mechanical warehousing systems, not computerized systems.

The company has been awarded a large contract for a robotics system for placement, storage, retrieval, and routing of shipping containers for truck and rail by the Midwest Parcel Distribution Company. This system, called the Logistical On-line System, or LOGON, is to be developed and installed at the company's main distribution center in Chicago. The contract is for a fixed price of \$1.462 million which includes design, fabrication, testing and installation at the center. The contract was awarded to STING because they have an outstanding reputation for quality and service. STING did not have the lowest bid however theirs was competitive. A clause in the contract imposes a penalty of \$1,000 per day for failure to meet the contract delivery date.

At various times throughout the estimated 47-week project, personnel will be involved from all of the functional divisions. Most personnel will be involved on a full-time basis for at least 4 or as many as 18 weeks. For most of STING's past projects, the company has set up ad hoc teams utilizing a coordinator and members selected from the various functional departments. These teams are responsible for planning and scheduling, but the actual work is still done by the functional departments. The members of these teams serve primarily as liaisons and work only part-time on the project.

The LOGON contract differs from other STING systems in its heavy usage of computer based technology, real-time operations via remote terminals, and its size. The company has no experience with real-time warehousing systems and is only now trying to hire engineers with the needed computer skills. Of further consequences, a contract has been signed with CRC, a major computer manufacturer, to provide hardware, programming support, and to assist with systems installation and checkout.

The LOGON contract is roughly 40% greater than anything STING has done before. At present, STING is in the middle of two other projects that absorb three-quarters of its labor capacity and STING has three outstanding proposals for smaller projects under review.

Your Job

Assume that the Executive Committee at STING has given you the responsibility for the LOGON project. You have had some problems with completing projects on time and within budget in the past. You are questioning whether or not this project should be managed differently.

Questions:

1. What recommendations do you have on the best way to manage this project?
2. How will you plan to ensure that customer expectations are met?
3. What **metrics** will you employ to ensure that the project meets its objectives?
4. What help and support do you need from the Executive Committee?

The LOGON Project - ANSWERS

1. What recommendations do you have on the best way to manage this project?

Organize a project team as a projectized structure with the project manager and team members assigned on a full-time basis.

Negotiate with the functional managers and, if needed, get support from the CEO to dedicate the best resources to this top priority project.

Abandon the two other projects if necessary to focus attention on the LOGON project.

Subcontract programming support work to a competent supplier with experience in warehousing and material handling systems.

2. How will you plan to ensure that customer expectations are met?

Pay close personal attention to any changes in scope from the customer. Scope changes will provide an opportunity to renegotiate the contract to better terms; for example, eliminating the penalty clause, or moving to another more advantageous contract type.

Maintain close communications with the customer with regularly scheduled updates.

Make sure there are no surprises to the customer.

Manage customer expectations so that project performance is viewed positively.

3. What metrics will you employ to ensure that the project meets its objectives?

Milestones – are they being met?

Results of periodic inspection and tests – are they meeting specifications?

Review budget variances – are they within established tolerance levels?

Pay especially close attention to activities on the schedule's critical path.

4. What help and support do you need from the Executive Committee?

This is a “bet the farm” contract for STING. They need to be successful with LOGON in order to remain competitive in the field. Get full support from senior management for the necessary resources.

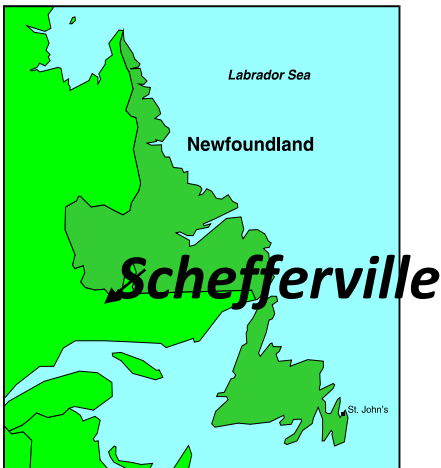
Risk Planning

Surviving the Frozen North

The following incident is based on actual cases where people lived or died based on how well the group shared their personal knowledge of a somewhat unfamiliar problem. It demonstrates that the group solution will more likely mirror the survival experts' choices versus the individual team member's choices.

The Incident

It is early afternoon on October 2nd and the float plane your project team is traveling in has just crash landed on the east shore of Lac Juin (June Lake) in the subarctic region of Northern Quebec and Newfoundland border. The pilot was killed in the crash but the rest of your team is uninjured. Each person is wet up to the waist and perspiring. Shortly after the crash the plane drifted into deep water and sank with the pilot's body inside.



The pilot was unable to contact anyone prior to the crash. However, ground sightings indicated that you are 35 miles south of your intended course and 20 miles east of Schefferville, your original destination and the nearest known habitation. Schefferville is reachable only by air and rail. Your team did file a Flight Notification Form with the Department of Transportation that it expected to return from northwestern Labrador to Schefferville no later than October 18th.

The immediate area is covered with small evergreen trees. Scattered in the area are a number of barren hills. Tundra (arctic swamps) makes up the valleys and consist of only small shrubs. Nearly 25% of the area in the region is covered by long, narrow lakes.

Temperatures in October typically range between 25°F and 36°F. Nearly 90% of the time the days are cloudy. About six inches of snow are on the ground now but because of the winds out of the northwest, the actual depth can increase to 5' due to snowdrifts.

You are dressed in insulated underwear, socks, heavy wool shirt, pants, snow gloves, sheepskin jacket, knitted wool cap and heavy leather hunting boots. Your personal possessions consist of: \$150 in bills, 2 half-dollars, 4 quarters, 2 dimes, 1 nickel and three pennies. You also have a pocket knife (two blades and an awl resembling an ice pick), one lead pencil and an air map.

The Problem

Before the plane sank you were able to salvage the 15 items on the attached page. Your task is to rank these items according to their importance to your survival, starting with 1 as most important and 15 as least important.

You may assume:

1. The number of survivors is the same as the number of team members.
2. You are the actual team in this situation.
3. Your team has agreed to stick together.
4. All items are dry and in good condition.

Step 1

Individually, **without discussing the situation or the items with anyone else**, rank each item on the attached sheet according to its level of importance to your survival.

Step 2

After each team member has finished the individual ranking, proceed to rank order the 15 items as a team. Record the results on the attached score sheet.

Other facts:

Sunrise: 6:15 a.m.

Sunset: 5:45 p.m.

Average 11 days of snowfall in October

Based on Exercise Developed by J. Clayton Lafferty, Ph .D. of Human Synergistics

ACTIVITY WORKSHEET – Frozen Survival

List of Items

Items	Step 1 Your Individual Ranking	Step 2 The Team Ranking	Step 3 Survival Experts' Ranking	Step 4 Difference Between Steps 1 & 3	Step 5 Difference Between Steps 2 & 3
A magnetic compass					
A gallon can of maple syrup					
A sleeping bag per person (arctic type down filled with liner)					
A bottle of water purification tablets					
A 20' X 20' piece of heavy duty canvas					
13 wood matches in a metal screwtop, waterproof container					
250 ft. of 1/4 inch braided nylon rope, 50 pound test					
An operating 4 battery flashlight					
3 pair of snowshoes					
A fifth of Bacardi rum (151 proof)					
Safety razor shaving kit with mirror					
A wind-up alarm clock					
A hand axe					
One aircraft inner tube for a 14 inch wheel (punctured)					
A book entitled Northen Star Navigation					
			Totals (the lower the score the better)	Individual Score Step 4	Team Score Step 5

Solution to Subarctic Survival Exercise

1. Waterproof wood matches - needed to start a fire to keep warm. Smoke from the fire can signal air craft.
2. Small ax -
Survivors need a constant supply of wood in order to maintain the fire. The ax could be used for this as well as for clearing a sheltered campsite, cutting tree branches for ground insulation, and constructing a frame for the canvas tent. There were two reasons for the fire, one - you were stranded in Northern Quebec in the middle of winter and second, the smoke could be seen by rescue planes.
3. 20 x 20 foot piece of canvas -
The cold makes shelter necessary, and canvas would protect against wind and snow (canvas is used in making tents). Spread on a frame made of trees, it could be used as a tent or a wind screen. It might also be used as a ground cover to keep the survivors dry. It's shape, when contrasted with the surrounding terrain, makes it a signaling device.
4. Sleeping Bag – Need to keep warm and get some sleep.
5. Gallon of maple syrup – Personal nourishment plus use the container to collect water.
6. Braided nylon rope – Multiple uses. Use rope to set up a tent with the canvas, for example.
7. Three pair of snowshoes – Use to hike to cut down trees, or for fishing or hunting. Helps to stay above the snow and ice, not in it.
8. Inner tube – Cut up pieces and make a sling shot to shoot at birds.
9. Safety razor shaving kit with mirror – Use mirror to signal for help. Use razor as a cutting device.
10. Flashlight – Use as a signaling device. Note that batteries do not last well at low temperatures. Use to navigate at night.
11. A fifth of Bacardi rum -
The only uses of whiskey are as an aid in fire building and as a fuel for a torch (made by soaking a piece of clothing in the whiskey and attaching it to a tree branch). The empty bottle could be used for storing water. The danger of whiskey is that someone might drink it, thinking it would bring warmth. Alcohol takes on the temperature it is exposed to, and a drink of minus 30 degrees Fahrenheit whiskey would freeze a person's esophagus and stomach. Alcohol also dilates the blood vessels in the

skin, resulting in chilled blood being carried back to the heart, resulting in a rapid loss of body heat. Thus, an intoxicated person is more likely to get hypothermia than a sober person is.

12. Wind-up alarm clock - Take the spring out and use it as a fish hook.
13. Magnetic compass – Not worth much near the North Pole. Compass will not be accurate.
14. Book on Northern Star navigation - Not worth much other than toilet paper. Northern Star will be overhead.
15. Bottle of water purification tablets –No use other than the container. The water near the North Pole is very pure and safe to drink.

Just remember, DO NOT PANIC. We are going to stay put even though we can walk 20 miles in the summer, but in the winter we will be asking for much trouble if we start walking. The search planes will not find us, we will get wet and cold and perhaps hypothermia, and we will probably die for sure if we leave the crash site. Just stay there, keep warm and dry and for goodness sake, make the fire huge. You are not going to run out of wood, and you need to be noticed from a long way off by airplane.

List of Items

Items	Step 1 Your Individual Ranking	Step 2 The Team Ranking	Step 3 Survival Experts' Ranking	Step 4 Difference Between Steps 1 & 3	Step 5 Difference Between Steps 2 & 3
A magnetic compass			13		
A gallon can of maple syrup			5		
A sleeping bag per person (arctic type down filled with liner)			4		
A bottle of water purification tablets			15		
A 20' X 20' piece of heavy duty canvas			3		
13 wood matches in a metal screwtop, waterproof container			1		
250 ft. of 1/4 inch braided nylon rope, 50 pound test			6		
An operating 4 battery flashlight			10		
3 pair of snowshoes			7		
A fifth of Bacardi rum (151 proof)			11		
Safety razor shaving kit with mirror			9		
A wind-up alarm clock			12		
A hand axe			2		
One aircraft inner tube for a 14 inch wheel (punctured)			8		
A book entitled Northern Star Navigation			14		
			Totals (the lower the score the better)	Individual Score Step 4	Team Score Step 5

LESSON QUESTIONS

Questions Representative of Actual PMI® exam content
From former
CODE OF ETHICS AND PROFESSIONAL CONDUCT QUESTIONS

1. You are a project manager for a construction firm that specializes in luxury doghouses. Your firm builds three different types of doghouses. Over time a standard WBS has been prepared, and a scope change control system has been established. Most of the doghouses are constructed according to plan. Work is fairly routine except for that savage attack on your project control specialist by a pit bull last week, rendering his right arm useless for 3 months. On your last project, though, one dog owner wanted you to use a new and different material for laying the foundation. It seems that “Fido” breaks out in hives if he sleeps on concrete. Although this constituted a scope change, it turned out that this new material reduced the actual construction time by 20%. At the end of the project, you realized that its continued use would lead to significant improvement in your construction practices. Your next step should be to-
 - a. Document the lessons learned and share them within the company.
 - b. Adjust the schedule baseline to note the reduction in time.
 - c. Calculate the savings based on the schedule reduction and pass the savings on to the dog owner.
 - d. Issue a new methodology and mandate that it be followed.

2. A new regulation was just issued by a U.S. Government agency regarding the disposal of toxic waste. It states that firms can no longer dump toxic waste offshore even if the ship containing this waste is in international waters. Your company is hired by companies to dispose such industrial waste. You recommend to your firm’s management team that guidelines be developed in response to the new regulations. As a project management professional this shows the importance of:
 - a. Adhering to legal requirements and ethical standards.
 - b. Using legal requirements as the basis for all project selection criteria.
 - c. The limited timeframe in which projects must be completed.
 - d. Continually searching for new and more effective methods to do your work.

The answers to the above questions are both 'a'.

For question 1, b is wrong because the project is closed, c is wrong because this is an organizational decision, d is wrong because PM's recommend rather than mandate.

For question 2, b is wrong because projects are selected for many criteria other than regulations, c is wrong because it matches the wrong knowledge area, c is correct, but does not match the topic of the question.

Mod 1

1. The ability of a stakeholder to influence a project:

- a) increases over time
- b) decreases over time
- c) is not a factor for the project manager to consider
- d) stays the same over time

2. The five Project Management Processes consist of

- a) Monitoring, managing, planning, communicating, and obtaining feedback
- b) Initiating, planning, executing, monitoring and control, and closing
- c) Communicating, conducting meetings, analyzing, testing, and documenting
- d) Strategizing, managing, disciplining, planning, and measuring

3. Which of the following is the definition of a project?

- a) The application of knowledge, skills, tools and techniques in order to meet or exceed stakeholder requirements?
- b) A temporary endeavor undertaken to create a unique product or service
- c) Consists of project planning and control
- d) Related activities managed in a coordinated way that usually includes an element of ongoing activity

4. Which of these refers to a collection of projects or programs combined to meet strategic business objectives?

- a) Project
- b) Portfolio
- c) Program
- d) Project management

5. The purpose of a PMO is:

- a) Manage projects in the organization
- b) Serve as a staff function to project managers for training and methodology support
- c) Take the place of a Program Manager
- d) Another functional unit with available resources to be assigned to teams

6. Which of the following is not a Knowledge Area?

- a) Scope Management
- b) Risk Management
- c) Procurement Management
- d) Senior Management

7. Who is accountable for Project Management Integration?

- a) Senior Management
- b) CIO
- c) Project Manager
- d) Project team

8. The project life cycle always has the following number of phases:

- a) Six
- b) Five
- c) Four
- d) It depends on the type of project

9. Which of the following is not an example of possible life cycle phases?

- a) Initiation, Planning, Implementation, Close-out
- b) Concept, Design, Construction, Validation, System Cut-over
- c) Initiating, planning, executing, monitoring, controlling, closing
- d) Strategy, design, build, test, startup

10. These are generally managed by a senior manager or senior management teams.

- a) Project
- b) Portfolio
- c) Program
- d) Tasks

Mod 2

1. In managing stakeholders, the project manager needs to:

- a) Tell only the positive results about the project
- b) Limit communications to email for efficiency
- c) Periodically meet with stakeholders to obtain their feedback and make any adjustments to the project plan
- d) Delegate communications with stakeholders to team members

2. The purpose of the **Stakeholders Engagement Assessment Matrix** is:

- a) Describes various strategies for project manager to use to get support
- b) Helps to identify stakeholders for the project
- c) Identifying gaps of stakeholder commitment
- d) Aids in structuring the project team

3. **Stakeholder expectations management is usually the responsibility of:**

- a) The project sponsor
- b) The performing organization
- c) The project team
- d) The project manager

4. **Brainwriting differs from Brainstorming in that ...**

- a) People share their ideas by writing them during the elicitation exercise.
- b) Participants take time to write down their ideas before the elicitation exercise.
- c) A facilitator writes the ideas on the board as participants share them.
- d) Brainwriting is the same as the Nominal Group Technique.

5. **Questionnaires and Surveys are important for all of the following reasons except:**

- a) They are the ideal solution when stakeholders are broadly geographically distributed.
- b) They best early in the project when you need to gather as much information as possible quickly.
- c) They are one of the easiest ways to obtain a quick and comprehensive response.
- d) They enable the facilitator to gather input from a very wide audience.

6. **One way for project managers to understand stakeholders is through interpersonal skills. A related project management assessment tool is:**

- a) DISK
- b) FORM
- c) HOOD
- d) SCARF

7. When considering stakeholders with high power and low interest, the best approach to take is ...

- a) Keep them informed.
- b) Monitor them closely.
- c) Manage the relationship.
- d) Keep them Satisfied.

8. The salience model uses three quadrants, named ...

- a) Power, Influence, Interest
- b) Power, Urgency, Legitimacy
- c) Dominant, Dependent, Discretionary
- d) Head, Heart, Hands

9. The core team is always comprised of ...

- a) The project manager, the business analyst, and the sponsor
- b) A group of six to eight team members.
- c) The PM, the customer, and subject matter experts.
- d) Everyone identified as accountable on the Responsibility Assignment Matrix.

10. You have ten minutes to touch base with a key stakeholder, which of the following might you reach out to first?

- a) The customer. Although they are supporting team efforts, it is always best to confirm their expectations.
- b) The sponsor. They are supporting your efforts, although you are aware they may need to champion an upcoming rollout.
- c) A functional manager. You know you will adding a few of their team members to the project team next week, though they tend to be resistant toward enabling the participation that you will need.
- d) A vendor. The contract was recently signed, and they are ready to start work. It is always good to touch base to confirm readiness.

Mod 3

1. The Triple Constraint consists of:

- a) Schedule, Scope and Cost
- b) Risk, Quality, Resources
- c) Time, Risk, Cost
- d) Cost, Resources, Budget

2. Progressive Elaboration:

- a) Defines the project scope
- b) Determines who the stakeholders are
- c) Adds detail to the project elements
- d) Summarizes requirements

3. The term “enterprise environmental factors” refers to:

- a) Existing processes and policies of the organization.
- b) External or internal organizational factors that affect the project success.
- c) Project boundaries, requirements and constraints.
- d) Project components and deliverables.

4. The Requirements Management Plan defines the following:

- a) The application of knowledge, skills, tools and techniques in order to meet or exceed stakeholder requirements?
- b) The overall scope of the project.
- c) How requirements will be analyzed, documented and managed.
- d) How the project will be managed and controlled.

5. What is Joint Application Development (JAD)?

- a) Building to specification
- b) Little customer involvement during software development
- c) A process used in software development
- d) A process used primarily by subcontractors

6. Managing a project includes:

- a) Balancing the competing demands for quality, scope, time and cost.
- b) Integrating requirements of profitability, low cost, and legal responsibility.
- c) Implementation of software, hardware, and other systems to enhance organizational efficiency.
- d) Supporting human factors, communications, discipline, and performance management.

7. What does the term “progressive elaboration” refer to?

- a) Constantly changing project scope.
- b) Gaining additional clarity to project deliverables as the project moves through the project lifecycle.
- c) Letting team members make scope changes without customer approval.
- d) Is only used where environments are uncertain.

8. The *project charter* should always include:

- a) A breakdown of the functions and activities to be performed on the project.
- b) A list of the project stakeholders and their areas of responsibilities.
- c) A schedule of project activities.
- d) A statement of project goals and authorization of the project manager to use organizational resources on the project.

9. The basic purpose of a feasibility study is:

- a) To determine the major activities within the project and break them into component work packages.
- b) To determine if the organization has the resources and capabilities required to do the project.
- c) To link the project to strategic goals.
- d) To meet regulatory reporting requirements.

10. Which of the following should be considered during project selection?

- a) Schedule baseline
- b) Cost baseline
- c) Strategic plan
- d) Project management plan

MOD 4

1. **The five stages of team development are:** [L] [SEP]

- a) Forming, storming, norming, performing and adjourning.
- b) Initiation, sharing, bonding, coordinating and performing.
- c) Forming, communicating, structuring, acceptance, and recognition.
- d) Creation, conflict, communicating, accepting and completion.

2. **In which organizational structure does the project manager have the most authority?** [L] [SEP]

- a) Weak matrix
- b) Strong matrix
- c) Functional structure
- d) Projectized structure

3. **A “Virtual Team” is a team that:**

- a) Does not actually exist.
- b) Is distributed across multiple locations.
- c) Is international in scope.
- d) Does not require team-building.

4. **A + or – 3-sigma limit indicates approximately what percentage of the process output will be within acceptable limits?**

- a) 30
- b) 80
- c) 68
- d) 99

5. **Jonah and Marty are the lead designers on the virtual jukebox project. They have been debating about the best database product to use in support of the new website they will be developing. As the project manager, in order to reach a decision and alleviate the conflict, you employ a collaborative approach.**

What is the characteristic of this approach?

- a) Directly addressing disagreements when the conflict is problematic.
- b) De-emphasizing differences and emphasizing commonality.
- c) Retreating from actual or potential disagreements.
- d) Working out a win-win solution through bargaining and compromise.

5. **Parametric estimating:**

- a. Uses durations from previous similar projects to estimate future durations.
- b. Uses formulas or data bases for future duration estimates.
- c. Relies on expert judgment.
- d. Uses optimistic, pessimistic and most likely durations.

6. A Rough Order of Magnitude estimate may have a range of:

- a. -50% to +50%
- b. -100% to +100%
- c. -50% to +100%
- d. -25% to +75%

7. What is the most commonly used formula for three-point estimates?

- a) $[\text{Optimistic time} + 4(\text{most likely time}) + \text{pessimistic time}]/6$
- b) $[\text{Optimistic time} + \text{most likely time} + \text{pessimistic time}]/6$
- c) $[\text{Optimistic time} + \text{most likely time} + \text{pessimistic time}]/3$
- d) $[\text{Optimistic time} + \text{most likely time} - \text{pessimistic time}]/2$

8. What task is related to the estimate activity resources planning process?

- a) Developing cost estimates for each resource required for project work.
- b) Apportioning resource cost estimates across all the work packages.
- c) Documenting product requirements and identifying potential sources.
- d) Estimating the type and quantities of the resources required to complete activities.

9. Parametric cost estimating involves:

- a) Defining the parameters of the project life cycle.
- b) Calculating individual cost estimates for each work package.
- c) Using statistical relationship between historical data and other variables to calculate a cost estimate.
- d) Using the actual cost of a similar project to estimate total project costs.

10. The accuracy of cost estimates:

- a) Increases as the project progresses
- b) Stays the same as the project progresses
- c) Decreases as the project progresses.
- d) Fluctuates as the project progresses

MOD 5

1. In the WBS, the level above the Work Package is called the:

- a) Code of account level
- b) Control account level
- c) Planning package level
- d) WBS Dictionary level

2. The process for breaking down the WBS from Major Deliverables to the Work Package level is called:

- a) Brainstorming
- b) Progressive Elaboration
- c) Decomposition
- d) Delphi Technique

3. The Work Breakdown Structure Dictionary:

- a) tells us detailed information about the work package
- b) provides definitions of terms used in project management
- c) shows us possible WBS templates
- d) None of the above

4. What is the item at the lowest level of a WBS?

- a) Task
- b) Sub-task
- c) Work package
- d) Cost account

5. What is the purpose of scope statement?

- a) To create an overall strategy for approaching the project.
- b) To define which tasks are included in a project and which tasks are not included.
- c) To provide a common understanding of the project's major objectives by identifying what is within scope and what is currently out of scope.
- d) To define the quality parameters affecting project procurements.

6. What is the main purpose of the decomposition process?

- a) Document results of lessons learned.
- b) Break down project deliverables into component activities.
- c) Estimate costs and duration for each sub-project.
- d) Allocate resources to each activity.

7. Which statement is true of WBS templates?

- a) They are time savers for the project team.
- b) They are usually not used, because no two projects are the same.
- c) They are only useful for high technology projects.
- d) They are used only when all of the work packages are identical to the project.

8. What does the WBS dictionary consist of?

- a) Terms used by project managers.
- b) Information about each work package in the WBS.
- c) Who's who on the project team.
- d) Details of the scope of the project.

9. What is meant by the code of accounts?

- a) A numbering system used to define activities in the statement of work.
- b) A numbering system that identifies the specific accounting category for each element of project work.
- c) A numbering system that rates activity durations for each work package.
- d) A numbering system for analyzing cost based on expert opinion.

10. What is scope creep?

- a) Reduction of project scope.
- b) A type of residual risk.
- c) Unmanaged changes to the project scope.
- d) An activity that needs to be included in the project schedule.

MOD 6

1. **Your PMO recommended an Agile schedule methodology. Which of the following tools would you not select?**

- a) Iterative scheduling with a backlog.
- b) A Gantt chart
- c) On Demand scheduling using a Kanban Board and constraints
- d) Lean, pull based activity selection

2. **The critical path is established by calculating the following dates:**

- a) Start-to-start, start-to-finish, finish-to-finish, finish-to-start.
- b) Early start, early finish, late start, late finish.
- c) Predecessor-to-successor, predecessor-to-predecessor, successor-to-successor.
- d) Primary-to-secondary, primary-to-finish, secondary-to-secondary, finish-to-finish.

3. **What is total float?**

- a) The amount of float on any network path.
- b) The amount of time that an activity can be delayed without delaying the early start of any immediately following activities.
- c) Calculated by subtracting late start from late finish.
- d) The amount of time on the network path that an activity can be ^{{}{}}_{SEP} delayed without delaying the completion date of the project.

4. **Activity A has a start-to-start precedence relationship with Activity B, with a two-day lag. If A's duration is eight days, and B's duration is five days, what is the total amount of time it will take to complete both A and B?**

- a) 8 days.
- b) 13 days.
- c) 15 days.
- d) 5 days.

5. **The project completion date will slip if:**

- a) Total float < 0.
- b) Total float = 0.
- c) Total float > 0.
- d) Total float > 1.

6. **What is meant by near-critical activity?**

- a) An activity that is on the critical path.
- b) An activity that may have higher risk to the project due to less risk mitigation than activities on the critical path.
- c) An activity that is not on the critical path but has low total float.
- d) An activity that has the longest duration.

7. What would be the outcome in a finish-to-start precedence relationship with a one-day lead?

- a) The precedent activity can start one day before the subsequent activity starts.
- b) The subsequent activity can start one day before the precedent activity is completed.
- c) The subsequent activity cannot start until one day after the precedent activity finishes.
- d) The subsequent activity must start within one day of when the precedent activity starts.

8. Which is an example of an FS (finish-to-start) interactivity relationship?

- a) Activity B can't finish until Activity A is completed.
- b) Activity B can't finish until Activity A starts.
- c) Activity B can't start until Activity A is completed.
- d) Activity B can't start until Activity A starts.

9. What does the precedence diagram method (PDM) show?

- a) Resource allocation
- b) Significant points in time
- c) Task duration
- d) Relationships

10. Which schedule tool is most associated with Agile projects?

- a) Critical Path
- b) Master Calendar
- c) The Chain method
- d) Target Schedule

MOD 7

1. Cost budgeting is a process to produce:

- a) A cost management plan.
- b) A contract.
- c) A cost baseline.
- d) Activity cost estimates.

2. The 50-50 cost assignment method states that:

- a) An activity gets credit when it is 50% complete and when it is 100% complete
- b) An activity gets 50% credit for starting and the other 50% for completing
- c) The contractor gets paid when the project is 50% complete and then again when the project is 100% complete
- d) The contractor gets paid 50% when the project starts and the other 50% when the project completes

3. Funds provided to the Project manager to assure work completion due to variance may be called:

- a) Contingency allowances
- b) Control Accounts
- c) Management reserves
- d) The budget

4. A management reserve may be used ...

- a) Whenever the project manager requires additional resources.
- b) When the contingency reserves are depleted.
- c) When expenditures exceed the cost baseline, as authorized by management.
- d) When expenditures exceed funding.

5. Which of the following is NOT an estimate costs output?

- a) Basis of estimates
- b) Cost estimates
- c) Lessons Learned Register
- d) Cost Baseline

6. Why is an Agile project unlikely to use an S-Curve as a baseline?

- a) Agile projects do not monitor budgets.
- b) Work is burned out rather than built up.
- c) Work is measured in releases, and release content may change during execution.
- d) You cannot calculate an Agile budget and schedule relationship.

7. You determined the cost for one work package using OPA from several previous projects. What is the basis of estimate for this work?

- a) 5 to 10%
- b) -5% to +10%
- c) + or - 15%
- d) + or - 35% because it is in the future.

8. Why isn't a budget the best cost baseline?

- a) They do not take the effect of time into account.
- b) They are the common baseline for most projects most of the time.
- c) Budgets use control accounts, and work package detail is more accurate.
- d) They require time to estimate, and work must often be initiated before the plan can be completed.

9. Your project is eight months long and requires a large assembly space. You can lease during the project based on an annual rate of \$1,000,000, or you can buy a new warehouse for \$5,000,000. At the end of the project, the warehouse will have an NPV of \$4,500,000. Should you lease or buy?

- a) Lease because the cost is only \$750,000 instead of \$4,500,000.
- b) Buy the warehouse because the project is only spending \$500,000.
- c) It doesn't matter because management makes large portfolio purchase decisions.
- d) There is insufficient information to make a recommendation because the values use different estimating methods.

10. Which is always the most accurate estimating method?

- a) Bottom-up.
- b) Approximate.
- c) Analogous.
- d) Top-Down.

MOD 8

1. **What does a cost performance index (CPI) of 0.8 mean to the project?:**

- a) Under-budget to date.
- b) Over-budget to date.
- c) On budget.
- d) Nothing; CPI values are always above 1.0.

2. **A project has a negative cost variance and an SPI less than 1.0 means that the project is:**

- a) Over budget and ahead of schedule.
- b) Under budget and behind schedule.
- c) Under budget and ahead of schedule
- d) Over budget and behind schedule.

3. ***Earned Value:***

- a) Is useful only with Maslow's Theory X.
- b) Looks only at the status of project cost to date.
- c) Is useful only on large government projects.
- d) Measures project performance to date.

4. **What does a schedule performance index (SPI) of 1.2 mean to the project?**

- a) Ahead of schedule.
- b) According to schedule.
- c) Behind schedule.
- d) Nothing; SPI values are always below 1.0.

5. **What is the schedule variance (SV) if the planned value (PV) is \$275,000 and the earned value (EV) is \$300,000?**

- a) \$25,000
- b) - \$25,000
- c) \$125,000
- d) \$575,000

6. **How do you calculate the cost performance index (CPI)?**

- a) Divide the earned value (EV) by the actual cost (AC).
- b) Divide the earned value (EV) by the planned value (PV).
- c) Subtract the actual cost (AC) from the earned value (EV).
- d) Subtract the planned value (PV) from the earned value (EV).

7. The playhouse project has a revised budget of \$30,000. To date, 70% of the revised budget has been spent and work is 50% completed. What is the earned value and actual cost to date?

- a) Actual cost = \$15,000; EV = \$21,000
- b) Unable to tell from the data presented.
- c) Actual cost = \$21,000; EV = \$15,000
- d) Actual cost = \$15,000; EV = \$15,000

8. An analytical tool(s) useful to the project manager for controlling the project cost and schedule performance is the:

- a) Gantt chart.
- b) PERT chart.
- c) Earned value analysis.
- d) Risk rating matrix.

9. What does an SV of .75 mean on an Agile project?

- a) You will make up the delay in the next sprint.
- b) You are behind schedule and will have to use a BurnUp chart to determine what to drop.
- c) Nothing, since Earned Value is not used on Agile projects.
- d) We are 25% behind schedule.

10. You review your Backlog and realize that you need incorporate all the remaining User Stories into the upcoming release. Your Earned Schedule is 65 days, and the Actual Time you spent is 75 days. How far behind are you?

- a) 10% behind
- b) 13% behind
- c) 13 days behind
- d) It doesn't matter because you will use a BurnUp chart to notify the Product Owner what will not be incorporated into this upcoming release.

MOD 9

1. Quality audits:

- a) Are only done at the end of the project.
- b) Check the fitness of the project's risk response plans.
- c) Are best done at the end of each project phase.
- d) Check the fitness of the project's output or the fitness of the quality plan.

2. W. Edwards Deming is well-known for what quality cycle?

- a) Forming-storming-norming-performing
- b) Plan-do-check-act
- c) Initiating-planning executing-monitoring & controlling-closing
- d) Concept-development-execution-closeout

3. Which of the following is not a quality cost?

- a) Prevention
- b) Scrap and rework
- c) Inspection
- d) Inventory

4. The Plan Quality Management Process is the process of:

- a) Systematically evaluating project quality.
- b) Establishing a communications plan between stakeholders and work package owners for quality updates.
- c) Evaluating quality results and planning improvement strategies.
- d) Identifying the quality standards that apply to the project and determining how to meet those standards.

5. Benchmarking can help determine:

- a) When to launch a new product.
- b) Marketing sales costs associated with a specific product.
- c) What processes are used by other organizations to achieve customer satisfaction.
- d) When to request a quality audit.

6. The types of costs associated with quality are:

- a) The costs for maintaining the product or system.
- b) Prevention, appraisal, and failure costs.
- c) Product life cycle costs
- d) Production and distribution.

7. Standards are:

- a) Compliance-mandatory characteristics.
- b) An output of quality planning.
- c) Non-mandatory guidelines.
- d) Typically issued by the government.

8. On which concept is “Total Quality Management” based?

- a) Quality is an ongoing process rather than a one-time event.
- b) Quality standards should be established universally in every industry.
- c) Quality issues should be supervised and controlled by a quality management team.
- d) Quality planning is the most integral part of the quality system.

9. Who is the quality guru associated with “breakthrough improvement”?

- a) Taguchi
- b) Deming
- c) Juran
- d) Crosby

10. What action is taken to bring a product or service into compliance with customer specifications?

- a) Scrap
- b) Audit
- c) Recall
- d) Rework

MOD 10

1. **The communications management consists of all of these except:**

- a) Information flow charts
- b) Limiting communications to email for efficiency
- c) Person authorized for confidential information release
- d) Stakeholder communication requirements

2. **In preparing a communications management plan for the project, the following is ^{SEP}a tool or technique:**

- a) Organizational process assets
- b) Enterprise environmental factors
- c) Communications technology
- d) Project scope statement

3. **You realize that as you increase the number of stakeholders, you increase the number of communication channels. Your current project has 18 stakeholders total. How many communication channels are there on this project?**

- a) 36
- b) 162
- c) 153
- d) 100

4. **The communications management plan:**

- a) Should not be shared with the project team.
- b) Should be incorporated into the overall project plan.
- c) Is constantly changing throughout the project life cycle.
- d) Should be maintained and updated by the project sponsor.

5. **The communications management plan is a most important portion of the project management plan for managing stakeholders. For what reason?**

- a) It keeps the stakeholder involved with the day-to-day management of the project.
- b) It helps the project manager to understand stakeholder requirements for project communications.
- c) It gets stakeholders involved in the planning process.
- d) It helps identify all stakeholder needs and objectives for the project

6. **Which of the following statements is not true of tacit knowledge?**

- a) Tacit knowledge has context though is difficult to codify
- b) Knowledge management requires you to convert tacit knowledge to explicit knowledge.
- c) Tacit knowledge is public knowledge
- d) Tacit knowledge includes beliefs, experience and insights.

7) The lessons learned register is:

- a) Created solely by the project manager and stored in the archives.
- b) Is the history of the project recorded by the team during the work.
- c) Is a form of tacit knowledge.
- d) Used as a tool during project execution.

8) The characteristics of a good status meeting are:

- a) Predetermined agenda, invitations, reminders
- b) Targeted, concise, responsive
- c) Short, concise, unidirectional
- d) Inclusive, interactive, daily

9) The cross-cultural communication model is also referred to as:

- a) The emotional state model
- b) International communication model
- c) Encode-transmit-decode-acknowledge-reply
- d) Full duplex

10) Project managers are always proactive, operating with truth and integrity. Which following skills are related to communication?

- a) IQ, EQ, CQ
- b) Leadership, coaching, directing
- c) Feedback, non-verbal, presentations
- d) Friendly, courteous, kind

MOD 11

1. Decision tree analysis is a technique for:

- a) Technical problem solving.
- b) Examining future scenarios when their outcomes are uncertain.
- c) Prioritizing causes of defects.
- d) Determining resource allocations.

2. Which of the following is not a risk tolerance classification?

- a) Risk-avertter
- b) Risk-seeker
- c) Risk-neutral
- d) Risk-planner

3. Risk response strategies for opportunities are:

- a) The same as for threats.
- b) Determined by the sponsor.
- c) Risk exploitation, risk sharing, and risk enhancement.
- d) Risk avoidance, risk transference, and risk mitigation.

4. The risk response that can be categorized as either passive or active is:

- a) Risk avoidance.
- b) Risk mitigation.
- c) Risk acceptance.
- d) Risk transference.

5. The four areas that risk can affect on a project are:

- a) Methods, materials, metrics, and people.
- b) Initiation, planning, executing, and closing.
- c) Time, cost, quality, and scope.
- d) Design, supply chain, production, and marketing.

6. Which of these statements applies to risk mitigation?

- a) Deflects the risk to the consumer
- b) Accepts consequences
- c) Uses an alternative approach
- d) Reduces impact and/or probability

7. The purpose of a quantitative risk analysis is to:

- a) Using low, medium and high, assess the likelihood of the identified risks actually occurring.
- b) Analyze numerically the probability and impact of each risk.
- c) Determine if the risk responses have been implemented as planned.
- d) Select alternative strategies for dealing with risks.

8. Possible risk responses to opportunities include:

- a) Risk avoidance
- b) Risk enhancement
- c) Risk development
- d) Risk mitigation

9. During the project's life cycle, risk identification:

- a) Is no longer needed during the closing phase of a project.
- b) Is done during the implementation and planning phases only.
- c) Is done during the planning phase only.
- d) Should take place during each project phase.

10. Management is concerned about the practice of cost estimators and project managers inflating cost estimates. To deal with this practice, management informed you that you will be allowed a contingency reserve if you can support the reserve with real data. From your project management training you realize that all of the following are true about contingency reserve *except*:

- a) They are set up for expected but not certain events
- b) They are part of your project schedule and cost baselines
- c) They are for the unknown unknowns
- d) They can be used at the good judgment of the project manager

MOD 12

1. **Which allows potential sellers to ask questions about the project and its requirements?**
 - a) Advertised bids
 - b) Bidder conference
 - c) Sellers conference
 - d) Annual meeting

2. **Make-or-Buy Analysis** is a technique:
 - a) To transfer risk to the vendor
 - b) To justify using internal resources
 - c) That can significantly impact project time, cost, and quality
 - d) To satisfy senior management

3. **Your company has an emergency and needs contracted work done as soon as possible. Under these circumstances, which of the following would be helpful to add to the contract?**
 - a) A clear contract statement of work
 - b) Requirements as to which subcontractors can be used
 - c) Incentives
 - d) A force majeure clause

4. **In order to minimize any financial risk to your project, you propose what type of contract to your selected vendors?**
 - a) Cost Plus Fee
 - b) Time and Materials
 - c) Fixed Price
 - d) None of these

5. **Which statement best describes the “Time and Materials” contract?**
 - a) The buyer pays the seller one fixed price.
 - b) The buyer pays the seller for time and expenses of project work.
 - c) The buyer pays the seller a fee, plus a percentage of profit.
 - d) The buyer pays the seller their allowable costs plus a fee.

6. **Which document provides a description of the work authorized to be performed by a supplier?**
 - a) Project plan
 - b) Procurement statement of work
 - c) Responsibility assignment matrix
 - d) Work breakdown system

7. During the make-or-buy analysis your team considered the immediate need for specialized hardware as well as the long-term need expressed by the organization. If the organization anticipates a long-term need for the item then the cost charged to the project:

- a) may be more than the actual costs
- b) will be the actual costs
- c) may be less than the actual costs
- d) may include the organization's investment for the future

8. An emergency has occurred and you need a safety contractor to do some consulting work fast. In this circumstance you are most likely to use a:

- a) Fixed price contract
- b) Fixed price incentive contract
- c) Cost plus incentive contract
- d) Time and materials contract

9. Which is included on a qualified sellers' list?

- a) Sellers' names
- b) Procurement documents
- c) Proposals
- d) Advertised bids

10. Which are tools and techniques for the conduct procurement process?

- a) Bidder conferences, SWOT analysis, independent estimates, expert judgment
- b) Procurement negotiations, advertising, contingent response strategies, proposal evaluation techniques.
- c) Independent estimates, make-or-buy decisions, qualified seller lists, source selection criteria.
- d) Bidder conferences, expert judgment, procurement negotiations

MOD 13

1. The project manager is making sure that a deliverable of the project has been completed according to the project management plan. What part of the project management process is s/he in?

- a) Planning
- b) Executing
- c) Monitoring and controlling
- d) Closing

2. The project manager is taking into consideration the impact of a particular change. Which of the following should the project manager take into consideration?

- a) Sponsor's recommendation
- b) Triple constraint impact
- c) Impact on quality
- d) Impact on cost

3. Configuration Control focuses on:

- a) Changes to project documentation
- b) Changes to product specifications or product component delivery
- c) Integrated change control
- d) Changes to scope

4. An example of scope verification is:

- a) Reviewing the performance of an installed software module.
- b) Managing changes to the project schedule.
- c) Decomposing the WBS to a work package level.
- d) Performing a benefit-cost analysis to determine if we should proceed.

5. What notifies the work package owners when to begin work?

- a) Project schedule
- b) Status review system
- c) Work authorization form
- d) PMIS

6. Which manual or automated tool and technique is used to collect, archive, and distribute project information on a project?

- a) Project management information system
- b) Communications plan
- c) Project management enterprise software
- d) Communications and feedback system

7. Work performance information:

- a) Describes which project elements are going to be measured and how they will be measured.
- b) Gives instructions for examining processes in order to identify non-value-added project activities.
- c) Is an automated system used to gather, analyze, communicate and store project information.
- d) Consists of periodically collected information about project activities being performed.

8. Which statement best describes the project controlling process?

- a) Is used strictly to control scope changes.
- b) Is used by the project team throughout the project.
- c) Is used only in the control phase of the project.
- d) Is used to control changes made as a result of project planning and execution.

9. The control processes are repeated throughout the project life cycle.

Therefore, which term can be attributed to the control processes?

- a) Facilitative
- b) Integrative
- c) Core processes
- d) Cyclical

10. Which element is a collection of formal, documented procedures that defines the steps by which the project may be changed?

- a) Managing by objective
- b) Change control system
- c) Managing by exception
- d) Configuration management

MOD 14

1. An output of administrative closure is the creation of:

- a) project archives.
- b) a project charter.
- c) a project management plan.
- d) a risk analysis plan.

2. A project team has completed, and the customer has accepted, the completed project scope. However, the lessons learned required by the project management office have not been completed. What is the status of the project?

- a) The project is incomplete because the project needs to be re-planned.
- b) The project is incomplete until all project and product deliverables are complete and accepted.
- c) The project is complete because the customer has accepted the deliverables.
- d) The project is complete because the project has reached the due date.

3. Which process is concerned with obtaining formal stakeholder acceptance of completed project deliverables?

- a) Project plan execution
- b) Scope management
- c) Administrative closure
- d) Quality assurance

4. Which is true of project archives?

- a) Should never contain computerized records, because they may not be retrievable in later software.
- b) Should include key information, such as baselines and performance data.
- c) Should be handed to the sponsor at the end of the project.
- d) Should be updated only at the end of the project.

5. Which set of items are outputs of the close project or phase process?

- a) Closed procurements
- b) Final product, service, or result
- c) Procurement management plan and documentation
- d) Project management plan, accepted deliverables

6. Transition is usually an accountability assigned to a business analyst. From a project management perspective, which concept most closely associates with transition?

- a) Closing procurements
- b) Verification
- c) The product life-cycle
- d) Monitoring and Controlling

7. Considerable resources were spent completing project work. The customer elects not to purchase or pay for the product since it fails to meet their needs. Although this should have been caught much earlier, this is the nature of your business at times. How would you classify the project expenses?

- a) Non-conformance
- b) Sunk
- c) Contract breach
- d) Passive acceptance

LESSON

ANSWERS

Mod 1

1. The ability of a stakeholder to influence a project:

- a) increases over time
- b) **decreases over time**
- c) is not a factor for the project manager to consider
- d) stays the same over time

2. The five Project Management Processes consist of

- a) Monitoring, managing, planning, communicating, and obtaining feedback
- b) **Initiating, planning, executing, monitoring and control, and closing**
- c) Communicating, conducting meetings, analyzing, testing, and documenting
- d) Strategizing, managing, disciplining, planning, and measuring

3. Which of the following is the definition of a project?

- a) The application of knowledge, skills, tools and techniques in order to meet or exceed stakeholder requirements?
- b) **A temporary endeavor undertaken to create a unique product or service**
- c) Consists of project planning and control
- d) Related activities managed in a coordinated way that usually includes an element of ongoing activity

4. Which of these refers to a collection of projects or programs combined to meet strategic business objectives?

- a) Project
- b) **Portfolio**
- c) Program
- d) Project management

5. The purpose of a PMO is:

- a) Manage projects in the organization
- b) **Serve as a staff function to project managers for training and methodology support**
- c) Take the place of a Program Manager
- d) Another functional unit with available resources to be assigned to teams

6. Which of the following is not a Knowledge Area?

- a) Scope Management
- b) Risk Management
- c) Procurement Management
- d) **Senior Management**

7. **Who is accountable for Project Management Integration?**
- a) Senior Management
 - b) CIO
 - c) **Project Manager**
 - d) Project team
8. **The project life cycle always has the following number of phases:**
- a) Six
 - b) Five
 - c) Four
 - d) **It depends on the type of project**
9. **Which of the following is not an example of possible life cycle phases?**
- a) Initiation, Planning, Implementation, Close-out
 - b) Concept, Design, Construction, Validation, System Cut-over
 - c) **Initiating, planning, executing, monitoring, controlling, closing**
 - d) Strategy, design, build, test, startup
10. **These are generally managed by a senior manager or senior management teams.**
- a) Project
 - b) **Portfolio**
 - c) Program
 - d) Tasks

Mod 2

1. In managing stakeholders, the project manager needs to:

- a) Tell only the positive results about the project
- b) Limit communications to email for efficiency
- c) **Periodically meet with stakeholders to obtain their feedback and make any adjustments to the project plan**
- d) Delegate communications with stakeholders to team members

2. The purpose of the **Stakeholders Engagement Assessment Matrix** is:

- a) Describes various strategies for project manager to use to get support
- b) Helps to identify stakeholders for the project
- c) **Identifying gaps of stakeholder commitment**
- d) Aids in structuring the project team

3. Stakeholder expectations management is usually the responsibility of:

- a) The project sponsor
- b) The performing organization
- c) **The project team**
- d) The project manager

4. Brainwriting differs from Brainstorming in that ...

- a) People share their ideas by writing them during the elicitation exercise.
- b) **Participants take time to write down their ideas before the elicitation exercise.**
- c) A facilitator writes the ideas on the board as participants share them.
- d) Brainwriting is the same as the Nominal Group Technique.

5. Questionnaires and Surveys are important for all of the following reasons except:

- a) They are the ideal solution when stakeholders are broadly geographically distributed.
- b) They best early in the project when you need to gather as much information as possible quickly.
- c) **They are one of the easiest ways to obtain a quick and comprehensive response.**
- d) They enable the facilitator to gather input from a very wide audience.

6. One way for project managers to understand stakeholders is through interpersonal skills. A related project management assessment tool is:

- e) DISK
- f) FORM
- g) HOOD
- h) **SCARF**

8. **When considering stakeholders with high power and low interest, the best approach to take is ...**
- a) Keep them informed.
 - b) Monitor them closely.
 - c) Manage the relationship.
 - d) **Keep them Satisfied.**
8. **The salience model uses three quadrants, named ...**
- e) Power, Influence, Interest
 - f) **Power, Urgency, Legitimacy**
 - g) Dominant, Dependent, Discretionary
 - h) Head, Heart, Hands
9. **The core team is always comprised of ...**
- e) The project manager, the business analyst, and the sponsor
 - f) **A group of six to eight team members.**
 - g) The PM, the customer, and subject matter experts.
 - h) Everyone identified as accountable on the Responsibility Assignment Matrix.
10. **You have ten minutes to touch base with a key stakeholder, which of the following might you reach out to first?**
- a) The customer. Although they are supporting team efforts, it is always best to confirm their expectations.
 - b) The sponsor. They are supporting your efforts, although you are aware they may need to champion an upcoming rollout.
 - c) **A functional manager. You know you will adding a few of their team members to the project team next week, though they tend to be resistant toward enabling the participation that you will need.**
 - d) A vendor. The contract was recently signed, and they are ready to start work. It is always good to touch base to confirm readiness.

Mod 3

2. The Triple Constraint consists of:

- a) **Schedule Scope and Cost**
- b) Risk, Quality, Resources
- c) Time, Risk, Cost
- d) Cost, Resources, Budget

2. Progressive Elaboration:

- a) Defines the project scope
- b) Determines who the stakeholders are
- c) **Adds detail to the project elements**
- d) Summarizes requirements

3. The term “enterprise environmental factors” refers to:

- a) Existing processes and policies of the organization.
- b) **External or internal organizational factors that affect the project success.**
- c) Project boundaries, requirements and constraints.
- d) Project components and deliverables.

4. The Requirements Management Plan defines the following:

- a) The application of knowledge, skills, tools and techniques in order to meet or exceed stakeholder requirements?
- b) The overall scope of the project.
- c) **How requirements will be analyzed, documented and managed.**
- d) How the project will be managed and controlled.

5. What is Joint Application Development (JAD)?

- a) Building to specification
- b) Little customer involvement during software development
- c) **A process used in software development**
- d) A process used primarily by subcontractors

6. Managing a project includes:

- a) **Balancing the competing demands for quality, scope, time and cost.**
- b) Integrating requirements of profitability, low cost, and legal responsibility.
- c) Implementation of software, hardware, and other systems to enhance organizational efficiency.
- d) Supporting human factors, communications, discipline, and performance management.

7. What does the term “progressive elaboration” refer to?

- a) Constantly changing project scope.
- b) **Gaining additional clarity to project deliverables as the project moves through the project lifecycle.**
- c) Letting team members make scope changes without customer approval.
- d) Is only used where environments are uncertain.

8. The *project charter* should always include:

- a) A breakdown of the functions and activities to be performed on the project.
- b) A list of the project stakeholders and their areas of responsibilities.
- c) A schedule of project activities.
- d) **A statement of project goals and authorization of the project manager to use organizational resources on the project.**

9. The basic purpose of a feasibility study is:

- a) To determine the major activities within the project and break them into component work packages.
- b) **To determine if the organization has the resources and capabilities required to do the project.**
- c) To link the project to strategic goals.
- d) To meet regulatory reporting requirements.

10. Which of the following should be considered during project selection?

- a) Schedule baseline
- b) Cost baseline
- c) **Strategic plan**
- d) Project management plan

MOD 4

1. **The five stages of team development are:**

- a) **Forming, storming, norming, performing and adjourning.**
- b) Initiation, sharing, bonding, coordinating and performing.
- c) Forming, communicating, structuring, acceptance, and recognition.
- d) Creation, conflict, communicating, accepting and completion.

2. **In which organizational structure does the project manager have the most authority?**

- a) Weak matrix
- b) Strong matrix
- c) Functional structure
- d) **Projectized structure**

3. **A “Virtual Team” is a team that:**

- a) Does not actually exist.
- b) **Is distributed across multiple locations.**
- c) Is international in scope.
- d) Does not require team-building.

4. **A + or – 3-sigma limit indicates approximately what percentage of the process output will be within acceptable limits?**

- a) 30
- b) 80
- c) 68
- d) **99**

5. **Jonah and Marty are the lead designers on the virtual jukebox project. They have been debating about the best database product to use in support of the new website they will be developing. As the project manager, in order to reach a decision and alleviate the conflict, you employ a collaborative approach.**

What is the characteristic of this approach?

- a) **Directly addressing disagreements when the conflict is problematic.**
- b) De-emphasizing differences and emphasizing commonality.
- c) Retreating from actual or potential disagreements.
- d) Working out a win-win solution through bargaining and compromise.

5. **Parametric estimating:**

- a) Uses durations from previous similar projects to estimate future durations.
- b) **Uses formulas or data bases for future duration estimates.**
- c) Relies on expert judgment.
- d) Uses optimistic, pessimistic and most likely durations.

6. **A Rough Order of Magnitude estimate may have a range of:**

- a. -50% to +50%
- b. -100% to +100%
- c. -50% to +100%
- d. **-25% to +75%**

7. **What is the most commonly used formula for three-point estimates?**

- a) $[\text{Optimistic time} + 4(\text{most likely time}) + \text{pessimistic time}]/6$
- b) $[\text{Optimistic time} + \text{most likely time} + \text{pessimistic time}]/6$
- c) **$[\text{Optimistic time} + \text{most likely time} + \text{pessimistic time}]/3$**
- d) $[\text{Optimistic time} + \text{most likely time} - \text{pessimistic time}]/2$

8. **What task is related to the estimate activity resources planning process?**

- a) Developing cost estimates for each resource required for project work.
- b) Apportioning resource cost estimates across all the work packages.
- c) Documenting product requirements and identifying potential sources.
- d) **Estimating the type and quantities of the resources required to complete activities.**

9. **Parametric cost estimating involves:**

- a) Defining the parameters of the project life cycle.
- b) Calculating individual cost estimates for each work package.
- c) **Using statistical relationship between historical data and other variables to calculate a cost estimate.**
- d) Using the actual cost of a similar project to estimate total project costs.

10. **The accuracy of cost estimates:**

- a) **Increases as the project progresses**
- b) Stays the same as the project progresses
- c) Decreases as the project progresses.
- d) Fluctuates as the project progresses

MOD 5

1. In the WBS, the level above the Work Package is called the:

- a) Code of account level
- b) **Control account level**
- c) Planning package level
- d) WBS Dictionary level

2. The process for breaking down the WBS from Major Deliverables to the Work Package level is called:

- a) Brainstorming
- b) Progressive Elaboration
- c) **Decomposition**
- d) Delphi Technique

3. The Work Breakdown Structure Dictionary:

- a) **tells us detailed information about the work package**
- b) provides definitions of terms used in project management
- c) shows us possible WBS templates
- d) None of the above

4. What is the item at the lowest level of a WBS?

- a) Task
- b) Sub-task
- c) **Work package**
- d) Cost account

5. What is the purpose of scope statement?

- a) To create an overall strategy for approaching the project.
- b) To define which tasks are included in a project and which tasks are not included.
- c) **To provide a common understanding of the project's major objectives by identifying what is within scope and what is currently out of scope.**
- d) To define the quality parameters affecting project procurements.

6. What is the main purpose of the decomposition process?

- a) Document results of lessons learned.
- b) **Break down project deliverables into component activities.**
- c) Estimate costs and duration for each sub-project.
- d) Allocate resources to each activity.

7. Which statement is true of WBS templates?

- a) **They are time savers for the project team.**
- b) They are usually not used, because no two projects are the same.
- c) They are only useful for high technology projects.
- d) They are used only when all of the work packages are identical to the project.

8. What does the WBS dictionary consist of?

- a) Terms used by project managers.
- b) **Information about each work package in the WBS.**
- c) Who's who on the project team.
- d) Details of the scope of the project.

9. What is meant by the code of accounts?

- a) **A numbering system used to define activities in the statement of work.**
- b) A numbering system that identifies the specific accounting category for each element of project work.
- c) A numbering system that rates activity durations for each work package.
- d) A numbering system for analyzing cost based on expert opinion.

10. What is scope creep?

- a) Reduction of project scope.
- b) A type of residual risk.
- c) **Unmanaged changes to the project scope.**
- d) An activity that needs to be included in the project schedule.

MOD 6

1. Your PMO recommended an Agile schedule methodology. Which of the following tools would you not select?

- a) Iterative scheduling with a backlog.
- b) **A Gantt chart**
- c) On Demand scheduling using a Kanban Board and constraints
- d) Lean, pull based activity selection

2. The critical path is established by calculating the following dates:

- a) Start-to-start, start-to-finish, finish-to-finish, finish-to-start.
- b) **Early start, early finish, late start, late finish.**
- c) Predecessor-to-successor, predecessor-to-predecessor, successor-to-successor.
- d) Primary-to-secondary, primary-to-finish, secondary-to-secondary, finish-to-finish.

3. What is total float?

- a) The amount of float on any network path.
- b) The amount of time that an activity can be delayed without delaying the early start of any immediately following activities.
- c) Calculated by subtracting late start from late finish.
- d) **The amount of time on the network path that an activity can be delayed without delaying the completion date of the project.**

4. Activity A has a start-to-start precedence relationship with Activity B, with a two-day lag. If A's duration is eight days, and B's duration is five days, what is the total amount of time it will take to complete both A and B?

- a) **8 days.**
- b) 13 days.
- c) 15 days.
- d) 5 days.

5. The project completion date will slip if:

- a) **Total float < 0.**
- b) Total float = 0.
- c) Total float > 0.
- d) Total float > 1.

6. What is meant by near-critical activity?

- a) An activity that is on the critical path.
- b) An activity that may have higher risk to the project due to less risk mitigation than activities on the critical path.
- c) **An activity that is not on the critical path but has low total float.**
- d) An activity that has the longest duration.

7. **What would be the outcome in a finish-to-start precedence relationship with a one-day lead?**

- a) The precedent activity can start one day before the subsequent activity starts.
- b) **The subsequent activity can start one day before the precedent activity is completed.**
- c) The subsequent activity cannot start until one day after the precedent activity finishes.
- d) The subsequent activity must start within one day of when the precedent activity starts.

8. **Which is an example of an FS (finish-to-start) interactivity relationship?**

- a) Activity B can't finish until Activity A is completed.
- b) Activity B can't finish until Activity A starts.
- c) **Activity B can't start until Activity A is completed.**
- d) Activity B can't start until Activity A starts.

9. **What does the precedence diagram method (PDM) show?**

- a) Resource allocation
- b) Significant points in time
- c) Task duration
- d) **Relationships**

10. **Which schedule tool is most associated with Agile projects?**

- a) Critical Path
- b) Master Calendar
- c) The Chain method
- d) **Target Schedule**

MOD 7

1. Cost budgeting is a process to produce:

- a) A cost management plan.
- b) A contract.
- c) **A cost baseline.**
- d) Activity cost estimates.

2. The 50-50 cost assignment method states that:

- a) An activity gets credit when it is 50% complete and when it is 100% complete
- b) **An activity gets 50% credit for starting and the other 50% for completing**
- c) The contractor gets paid when the project is 50% complete and then again when the project is 100% complete
- d) The contractor gets paid 50% when the project starts and the other 50% when the project completes

3. Funds provided to the Project manager to assure work completion due to variance may be called:

- a) **Contingency allowances**
- b) Control Accounts
- c) Management reserves
- d) The budget

4. A management reserve may be used ...

- a) Whenever the project manager requires additional resources.
- b) When the contingency reserves are depleted.
- c) **When expenditures exceed the cost baseline, as authorized by management.**
- d) When expenditures exceed funding.

5. Which of the following is NOT an estimate costs output?

- a) Basis of estimates
- b) Cost estimates
- c) Lessons Learned Register
- d) **Cost Baseline**

6. **Why is an Agile project unlikely to use an S-Curve as a baseline?**

- a) Agile projects do not monitor budgets.
- b) Work is burned out rather than built up.
- c) **Work is measured in releases, and release content may change during execution.**
- d) You cannot calculate an Agile budget and schedule relationship.

7. **You determined the cost for one work package using OPA from several previous projects. What is the basis of estimate for this work?**

- a) 5 to 10%
- b) -5% to +10%
- c) **+ or - 15%**
- d) + or - 35% because it is in the future.

8. **Why isn't a budget the best cost baseline?**

- a) **They do not take the effect of time into account.**
- b) They are the common baseline for most projects most of the time.
- c) Budgets use control accounts, and work package detail is more accurate.
- d) They require time to estimate, and work must often be initiated before the plan can be completed.

9. **Your project is eight months long and requires a large assembly space. You can lease during the project based on an annual rate of \$1,000,000, or you can buy a new warehouse for \$5,000,000. At the end of the project, the warehouse will have an NPV of \$4,500,000. Should you lease or buy?**

- a) Lease because the cost is only \$750,000 instead of \$4,500,000.
- b) **Buy the warehouse because the project is only spending \$500,000.**
- c) It doesn't matter because management makes large portfolio purchase decisions.
- d) There is insufficient information to make a recommendation because the values use different estimating methods.

10. **Which is always the most accurate estimating method?**

- a) **Bottom-up.**
- b) Approximate.
- c) Analogous.
- d) Top-Down.

MOD 8

1. What does a cost performance index (CPI) of 0.8 mean to the project?:

- a) Under-budget to date.
- b) **Over-budget to date.**
- c) On budget.
- d) Nothing; CPI values are always above 1.0.

2. A project has a negative cost variance and an SPI less than 1.0 means that the project is:

- a) Over budget and ahead of schedule.
- b) Under budget and behind schedule.
- c) Under budget and ahead of schedule
- d) **Over budget and behind schedule.**

3. *Earned Value*:

- a) Is useful only with Maslow's Theory X.
- b) Looks only at the status of project cost to date.
- c) Is useful only on large government projects.
- d) **Measures project performance to date.**

4. What does a schedule performance index (SPI) of 1.2 mean to the project?

- a) **Ahead of schedule.**
- b) According to schedule.
- c) Behind schedule.
- d) Nothing; SPI values are always below 1.0.

5. What is the schedule variance (SV) if the planned value (PV) is \$275,000 and the earned value (EV) is \$300,000?

- a) **\$25,000**
- b) - \$25,000
- c) \$125,000
- d) \$575,000

6. How do you calculate the cost performance index (CPI)?

- a) **Divide the earned value (EV) by the actual cost (AC).**
- b) Divide the earned value (EV) by the planned value (PV).
- c) Subtract the actual cost (AC) from the earned value (EV).
- d) Subtract the planned value (PV) from the earned value (EV).

7. The playhouse project has a revised budget of \$30,000. To date, 70% of the revised budget has been spent and work is 50% completed. What is the earned value and actual cost to date?

- a) Actual cost = \$15,000; EV = \$21,000
- b) Unable to tell from the data presented.
- c) **Actual cost = \$21,000; EV = \$15,000**
- d) Actual cost = \$15,000; EV = \$15,000

8. An analytical tool(s) useful to the project manager for controlling the project cost and schedule performance is the:

- a) Gantt chart.
- b) PERT chart.
- c) **Earned value analysis.**
- d) Risk rating matrix.

9. What does an SV of .75 mean on an Agile project?

- a) You will make up the delay in the next sprint.
- b) **You are behind schedule and will have to use a BurnUp chart to determine what to drop.**
- c) Nothing, since Earned Value is not used on Agile projects.
- d) We are 25% behind schedule.

10. You review your Backlog and realize that you need to incorporate all the remaining User Stories into the upcoming release. Your Earned Schedule is 65 days, and the Actual Time you spent is 75 days. How far behind are you?

- a) 10% behind
- b) **13% behind**
- c) 13 days behind
- d) It doesn't matter because you will use a BurnUp chart to notify the Product Owner what will not be incorporated into this upcoming release.

MOD 9

1. Quality audits:

- a) Are only done at the end of the project.
- b) Check the fitness of the project's risk response plans.
- c) Are best done at the end of each project phase.
- d) **Check the fitness of the project's output or the fitness of the quality plan.**

2. W. Edwards Deming is well-known for what quality cycle?

- a) Forming-storming-norming-performing
- b) **Plan-do-check-act**
- c) Initiating-planning executing-monitoring & controlling-closing
- d) Concept-development-execution-closeout

3. Which of the following is not a quality cost?

- a) Prevention
- b) Scrap and rework
- c) Inspection
- d) **Inventory**

4. The Plan Quality Management Process is the process of:

- a) Systematically evaluating project quality.
- b) Establishing a communications plan between stakeholders and work package owners for quality updates.
- c) Evaluating quality results and planning improvement strategies.
- d) **Identifying the quality standards that apply to the project and determining how to meet those standards.**

5. Benchmarking can help determine:

- a) When to launch a new product.
- b) Marketing sales costs associated with a specific product.
- c) **What processes are used by other organizations to achieve customer satisfaction.**
- d) When to request a quality audit.

6. The types of costs associated with quality are:

- a) The costs for maintaining the product or system.
- b) **Prevention, appraisal, and failure costs.**
- c) Product life cycle costs
- d) Production and distribution.

7. Standards are:

- a) Compliance-mandatory characteristics.
- b) An output of quality planning.
- c) **Non-mandatory guidelines.**
- d) Typically issued by the government.

8. On which concept is “Total Quality Management” based?

- a) **Quality is an ongoing process rather than a one-time event.**
- b) Quality standards should be established universally in every industry.
- c) Quality issues should be supervised and controlled by a quality management team.
- d) Quality planning is the most integral part of the quality system.

9. Who is the quality guru associated with “breakthrough improvement”?

- a) Taguchi
- b) Deming
- c) **Juran**
- d) Crosby

10. What action is taken to bring a product or service into compliance with customer specifications?

- a) Scrap
- b) Audit
- c) Recall
- d) **Rework**

MOD 10

1. The communications management consists of all of these except:

- a) Information flow charts
- b) **Limiting communications to email for efficiency**
- c) Person authorized for confidential information release
- d) Stakeholder communication requirements

2. In preparing a communications management plan for the project, the following is a tool or technique:

- a) Organizational process assets
- b) Enterprise environmental factors
- c) **Communications technology**
- d) Project scope statement

3. You realize that as you increase the number of stakeholders, you increase the number of communication channels. Your current project has 18 stakeholders total. How many communication channels are there on this project?

- a) 36
- b) 162
- c) **153**
- d) 100

4. The communications management plan:

- a) Should not be shared with the project team.
- b) **Should be incorporated into the overall project plan.**
- c) Is constantly changing throughout the project life cycle.
- d) Should be maintained and updated by the project sponsor.

5. The communications management plan is a most important portion of the project management plan for managing stakeholders. For what reason?

- a) It keeps the stakeholder involved with the day-to-day management of the project.
- b) **It helps the project manager to understand stakeholder requirements for project communications.**
- c) It gets stakeholders involved in the planning process.
- d) It helps identify all stakeholder needs and objectives for the project

6. Which of the following statements is not true of tacit knowledge?

- a) Tacit knowledge has context though is difficult to codify
- b) Knowledge management requires you to convert tacit knowledge to explicit knowledge.
- c) **Tacit knowledge is public knowledge**
- d) Tacit knowledge includes beliefs, experience and insights.

7) **The lessons learned register is:**

- a) Created solely by the project manager and stored in the archives.
- b) **Is the history of the project recorded by the team during the work.**
- c) Is a form of tacit knowledge.
- d) Used as a tool during project execution.

8) **The characteristics of a good status meeting are:**

- b) Predetermined agenda, invitations, reminders
- b) Targeted, concise, responsive
- c) **Short, concise, unidirectional**
- d) Inclusive, interactive, daily

9) **The cross-cultural communication model is also referred to as:**

- a) The emotional state model
- b) International communication model
- c) **Encode-transmit-decode-acknowledge-reply**
- d) Full duplex

10) **Project managers are always proactive, operating with truth and integrity. Which following skills are related to communication?**

- a) IQ, EQ, CQ
- b) Leadership, coaching, directing
- c) **Feedback, non-verbal, presentations**
- d) Friendly, courteous, kind

MOD 11

1. **Decision tree analysis is a technique for:**

- a) Technical problem solving.
- b) **Examining future scenarios when their outcomes are uncertain.**
- c) Prioritizing causes of defects.
- d) Determining resource allocations.

2. **Which of the following is not a risk tolerance classification?**

- a) Risk-avertter
- b) Risk-seeker
- c) Risk-neutral
- d) **Risk-planner**

3. **Risk response strategies for opportunities are:**

- a) The same as for threats.
- b) Determined by the sponsor.
- c) **Risk exploitation, risk sharing, and risk enhancement.**
- d) Risk avoidance, risk transference, and risk mitigation.

4. **The risk response that can be categorized as either passive or active is:**

- a) Risk avoidance.
- b) Risk mitigation.
- c) **Risk acceptance.**
- d) Risk transference.

5. **The four areas that risk can affect on a project are:**

- a) Methods, materials, metrics, and people.
- b) Initiation, planning, executing, and closing.
- c) **Time, cost, quality, and scope.**
- d) Design, supply chain, production, and marketing.

6. **Which of these statements applies to risk mitigation?**

- a) Deflects the risk to the consumer
- b) Accepts consequences
- c) Uses an alternative approach
- d) **Reduces impact and/or probability**

7. The purpose of a quantitative risk analysis is to:

- a) Using low, medium and high, assess the likelihood of the identified risks actually occurring.
- b) **Analyze numerically the probability and impact of each risk.**
- c) Determine if the risk responses have been implemented as planned.
- d) Select alternative strategies for dealing with risks.

8. Possible risk responses to opportunities include:

- a) Risk avoidance
- b) **Risk enhancement**
- c) Risk development
- d) Risk mitigation

9. During the project's life cycle, risk identification:

- a) Is no longer needed during the closing phase of a project.
- b) Is done during the implementation and planning phases only.
- c) Is done during the planning phase only.
- d) **Should take place during each project phase.**

10. Management is concerned about the practice of cost estimators and project managers inflating cost estimates. To deal with this practice, management informed you that you will be allowed a contingency reserve if you can support the reserve with real data. From your project management training you realize that all of the following are true about contingency reserve *except*:

- a) They are set up for expected but not certain events
- b) They are part of your project schedule and cost baselines
- c) **They are for the unknown unknowns**
- d) They can be used at the good judgment of the project manager

MOD 12

1. **Which allows potential sellers to ask questions about the project and its requirements?**
 - a) Advertised bids
 - b) **Bidder conference**
 - c) Sellers conference
 - d) Annual meeting

2. **Make-or-Buy Analysis** is a technique:
 - a) To transfer risk to the vendor
 - b) To justify using internal resources
 - c) **That can significantly impact project time, cost, and quality**
 - d) To satisfy senior management

3. **Your company has an emergency and needs contracted work done as soon as possible. Under these circumstances, which of the following would be helpful to add to the contract?**
 - a) A clear contract statement of work
 - b) Requirements as to which subcontractors can be used
 - c) **Incentives**
 - d) A force majeure clause

4. **In order to minimize any financial risk to your project, you propose what type of contract to your selected vendors?**
 - a) Cost Plus Fee
 - b) Time and Materials
 - c) **Fixed Price**
 - d) None of these

5. **Which statement best describes the “Time and Materials” contract?**
 - a) The buyer pays the seller one fixed price.
 - b) **The buyer pays the seller for time and expenses of project work.**
 - c) The buyer pays the seller a fee, plus a percentage of profit.
 - d) The buyer pays the seller their allowable costs plus a fee.

6. **Which document provides a description of the work authorized to be performed by a supplier?**
 - a) Project plan
 - b) **Procurement statement of work**
 - c) Responsibility assignment matrix
 - d) Work breakdown system

7. **During the make-or-buy analysis your team considered the immediate need for specialized hardware as well as the long-term need expressed by the organization. If the organization anticipates a long-term need for the item then the cost charged to the project:**

- a) may be more than the actual costs
- b) will be the actual costs
- c) may be less than the actual costs**
- d) may include the organization's investment for the future

8. **An emergency has occurred and you need a safety contractor to do some consulting work fast. In this circumstance you are most likely to use a:**

- a) Fixed price contract
- b) Fixed price incentive contract
- c) Cost plus incentive contract
- d) Time and materials contract**

9. **Which is included on a qualified sellers' list?**

- a) Sellers' names**
- b) Procurement documents
- c) Proposals
- d) Advertised bids

10. **Which are tools and techniques for the conduct procurement process?**

- a) Bidder conferences, SWOT analysis, independent estimates, expert judgment
- b) Procurement negotiations, advertising, contingent response strategies, proposal evaluation techniques.
- c) Independent estimates, make-or-buy decisions, qualified seller lists, source selection criteria.
- d) Bidder conferences, expert judgment, procurement negotiations**

MOD 13

1. The project manager is making sure that a deliverable of the project has been completed according to the project management plan. What part of the project management process is s/he in?

- a) Planning
- b) Executing
- c) **Monitoring and controlling**
- d) Closing

2. The project manager is taking into consideration the impact of a particular change. Which of the following should the project manager take into consideration?

- a) Sponsor's recommendation
- b) **Triple constraint impact**
- c) Impact on quality
- d) Impact on cost

3. Configuration Control focuses on:

- a) Changes to project documentation
- b) **Changes to product specifications or product component delivery**
- c) Integrated change control
- d) Changes to scope

4. An example of scope verification is:

- a) **Reviewing the performance of an installed software module.**
- b) Managing changes to the project schedule.
- c) Decomposing the WBS to a work package level.
- d) Performing a benefit-cost analysis to determine if we should proceed.

5. What notifies the work package owners when to begin work?

- a) Project schedule
- b) Status review system
- c) **Work authorization form**
- d) PMIS

6. Which manual or automated tool and technique is used to collect, archive, and distribute project information on a project?

- a) **Project management information system**
- b) Communications plan
- c) Project management enterprise software
- d) Communications and feedback system

7. Work performance information:

- a) Describes which project elements are going to be measured and how they will be measured.
- b) Gives instructions for examining processes in order to identify non-value-added project activities.
- c) Is an automated system used to gather, analyze, communicate and store project information.
- d) **Consists of periodically collected information about project activities being performed.**

8. Which statement best describes the project controlling process?

- a) Is used strictly to control scope changes.
- b) **Is used by the project team throughout the project.**
- c) Is used only in the control phase of the project.
- d) Is used to control changes made as a result of project planning and execution.

9. The control processes are repeated throughout the project life cycle.

Therefore, which term can be attributed to the control processes?

- a) Facilitative
- b) Integrative
- c) Core processes
- d) **Cyclical**

10. Which element is a collection of formal, documented procedures that defines the steps by which the project may be changed?

- a) Managing by objective
- b) **Change control system**
- c) Managing by exception
- d) Configuration management

MOD 14

1. An output of administrative closure is the creation of:

- a) **project archives.**
- b) a project charter.
- c) a project management plan.
- d) a risk analysis plan.

2. A project team has completed, and the customer has accepted, the completed project scope. However, the lessons learned required by the project management office have not been completed. What is the status of the project?

- a) The project is incomplete because the project needs to be re-planned.
- b) **The project is incomplete until all project and product deliverables are complete and accepted.**
- c) The project is complete because the customer has accepted the deliverables.
- d) The project is complete because the project has reached the due date.

3. Which process is concerned with obtaining formal stakeholder acceptance of completed project deliverables?

- a) Project plan execution
- b) Scope management
- c) **Administrative closure**
- d) Quality assurance

4. Which is true of project archives?

- a) Should never contain computerized records, because they may not be retrievable in later software.
- b) **Should include key information, such as baselines and performance data.**
- c) Should be handed to the sponsor at the end of the project.
- d) Should be updated only at the end of the project.

5. Which set of items are outputs of the close project or phase process?

- a) Closed procurements
- b) **Final product, service, or result**
- c) Procurement management plan and documentation
- d) Project management plan, accepted deliverables

6. Transition is usually an accountability assigned to a business analyst. From a project management perspective, which concept most closely associates with transition?

- a) Closing procurements
- b) Verification
- c) **The product life-cycle**
- d) Monitoring and Controlling

7. Considerable resources were spent completing project work. The customer elects not to purchase or pay for the product since it fails to meet their needs. Although this should have been caught much earlier, this is the nature of your business at times. How would you classify the project expenses?

- a) Non-conformance
- b) **Sunk**
- c) Contract breach
- d) Passive acceptance

SAMPLE EXAM

SAMPLE PMP EXAM QUESTIONS – 6TH EDITION PMBOK GUIDE®

- 1) Risks will be identified during which risk management process(es)?
 - a) Quantitative risk analysis and risk identification
 - b) Risk identification and control risks
 - c) Qualitative risk analysis and risk monitoring and control
 - d) Risk identification

- 2) The highest point of Maslow's hierarchy of needs is:
 - a) physiological satisfaction.
 - b) attainment of survival.
 - c) need for association.
 - d) Self-actualization.

- 3) Who is ultimately accountable for quality management on the project?
 - a) Project engineer
 - b) Project manager
 - c) Quality manager
 - d) Team member

- 4) A heuristic is best described as a:
 - a) control tool.
 - b) scheduling method.
 - c) planning tool.
 - d) rule of thumb

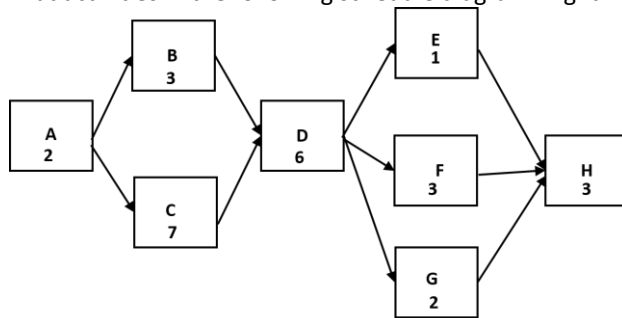
- 5) If earned value (EV) = 350, actual cost (AC) = 400, planned value (PV) = 325, what is cost variance (CV)?
 - a) 350
 - b) -75
 - c) 400
 - d) -50

- 6) A project manager has just been assigned to a new project and has been given the preliminary project scope statement and the project charter. The first thing the project manager must do is:
 - a) create a project scope statement.
 - b) confirm that all the stakeholders have had input into the scope.
 - c) analyze project risk.
 - d) begin work on a project management plan.

- 7) The project manager is making sure that the product of the project has been completed according to the project management plan. What part of the project management process is he in?
 - a) Planning
 - b) Executing
 - c) Monitoring and controlling
 - d) Closing

- 8) A project manager is employed by a construction company and is responsible for the furnishing of the completed building. One of the first things that the project manager for this project should do is to write a:
- Work breakdown structure.
 - Budget baseline.
 - Project charter.
 - Project plan.
- 9) Your company has an emergency and needs contracted work done as soon as possible. Under these circumstances, which of the following would be the helpful to add to the contract?
- A clear contract statement of work
 - Requirements as to which subcontractors can be used
 - Incentives
 - A force majeure clause
- 10) The "halo effect" refers to the tendency to:
- promote from within.
 - hire the best.
 - move people into project management because they are good in their technical fields.
 - move people into project management because they have project mgt training.

11) What activities in the following schedule diagram might have free float?



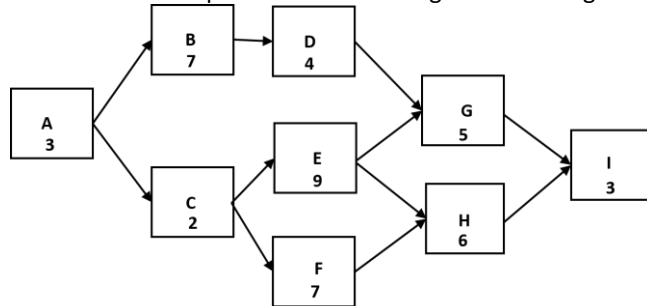
- Only a few
 - Without calculating, B, C, E, F, or G
 - Only activities on the critical path
 - A, D, H
- 12) A project manager is trying to complete a software development project, but cannot get enough attention for the project. Resources are focused on completing process-related work and the project manager has little authority to properly assign resources. What form of organization must the project manager be working in?
- Functional
 - Matrix
 - Expediter
 - Coordinator
- 13) All of the following are characteristics of a project EXCEPT:
- Temporary
 - Definite beginning and end
 - Interrelated activities
 - Repeats itself every month

- 14) During an Agile project life cycle, a tool used to measure the tasks remaining is called:
- a) A Kanban Board
 - b) The backlog
 - c) A burndown chart
 - d) The user story register
- 15) The equivalent of cost reimbursable contracts is frequently termed:
- a) Back charge contracts.
 - b) Fixed price contracts.
 - c) Progress payment contracts.
 - d) Cost plus contracts.
- 16) A buyer extends a formal invitation to prospective sellers seeking their response that will describe the methodology and concept solutions for the buyer. This is called:
- a) Invitation to bid.
 - b) Request for information.
 - c) Request for proposal.
 - d) Request for bid.
- 17) A project manager must have some work done by an outside contractor. This work has a great deal of risk associated with it, and it has become very difficult to find a contractor willing to take on the job. Which of the following types of contract would offer the greatest incentive to the contractor?
- a) Cost plus incentive fee
 - b) Cost plus fixed fee
 - c) Fixed price incentive fee
 - d) Firm fixed price
- 18) Purchasing insurance is considered an example of risk:
- a) mitigation.
 - b) transfer.
 - c) acceptance.
 - d) avoidance.
- 19) A cost performance index (CPI) of 0.89 means:
- a) at this time, we expect the total project to cost 89 percent more than planned.
 - b) when the project is completed we will have spent 89 percent more than planned.
 - c) the project is only progressing at 89 percent of that planned.
 - d) the project is only getting 89 cents out of every dollar invested.
- 20) In the matrix management organization, which of the following is true?
- a) The project manager is responsible for employee skills improvement.
 - b) The functional manager is responsible for employee skills improvement.
 - c) The project manager is responsible for the employee's annual appraisal.
 - d) The employee is responsible for his or her own skills improvement.

- 21) Your program manager has come to you, the project manager, for help with a bid for her newest project. You want to protect your company from financial risk. You have limited scope definition. What is the BEST type of contract to choose?
- a) Fixed price (FP)
 - b) Cost plus percent of cost (CPPC)
 - c) Time and material (T&M)
 - d) Cost plus fixed fee (CPFF)
- 22) The project management process groups are:
- a) Initiating, planning, expediting, and control.
 - b) Plan, organize, develop, and control.
 - c) Plan, do, observe, commit.
 - d) Initiating, planning, executing, controlling, and closeout.
- 23) In which project management process group is the detailed project budget created?
- a) Initiating
 - b) Before the project management process
 - c) Planning
 - d) Executing
- 24) Which of the following conflict resolution techniques will generate the MOST lasting solution?
- a) Forcing
 - b) Smoothing
 - c) Compromise
 - d) Problem solving
- 25) Which of the following best describes decomposition?
- a) Waiting for a task to expire so that it can break down into smaller tasks.
 - b) Taking a deliverable and breaking it down into the smaller work packages so that it can be organized and planned.
 - c) Categorizing work packages.
 - d) Dividing work packages into deliverables that can be planned for.
- 26) Any numbering system that is used to monitor project costs by category such as labor, supplies, or materials, for example, is called:
- a) Code of accounts.
 - b) Work breakdown structure.
 - c) Universal accounting standard.
 - d) Standard accounting practices.
- 27) Which of the following is NOT an input to the initiating process group?
- a) Company processes
 - b) The company culture
 - c) Historical WBSs
 - d) Project scope statement
- 28) A schedule performance index (SPI) of 0.76 means:
- a) you are over budget.
 - b) you are ahead of schedule.
 - c) you are only progressing at 76 percent of the rate originally planned.
 - d) you are only progressing at 24 percent of the rate originally planned.

- 29) An output of Close Project is the creation of:
- a) project archives.
 - b) a project charter.
 - c) a project management plan.
 - d) a risk analysis plan.
- 30) A temporary endeavor undertaken to create a new product or service is called a:
- a) New product development.
 - b) Project.
 - c) Program.
 - d) Enterprise.
- 31) Relative to resource estimating, how are smoothing and leveling related?
- a) Smoothing is another term for resource leveling
 - b) Smoothing averages resources across time
 - c) Leveling maintains the critical path, but smoothing doesn't
 - d) Smoothing maintains the critical path, but leveling doesn't
- 32) An example of scope validation is:
- a) Reviewing the performance of an installed software module.
 - b) Managing changes to the project schedule.
 - c) Decomposing the WBS to a work package level.
 - d) Performing a benefit-cost analysis to determine if we should proceed.
- 33) What conflict resolution technique is a project manager using when he says, "I cannot deal with this issue now!"
- a) Problem solving
 - b) Forcing
 - c) Withdrawal
 - d) Compromising
- 34) Approved change requests is an input to:
- a) Control Scope and Validate Scope.
 - b) Direct and manage project work and perform integrated change control.
 - c) Develop project management plan and develop project charter.
 - d) Develop project management plan and schedule development.
- 35) A group of related projects that are managed in a coordinated way that usually include an element of ongoing activity is called a:
- a) Major project.
 - b) Project office.
 - c) Program.
 - d) Group of projects.

36) What is the critical path for the following schedule diagram?



- a) A-B-D-G-I
- b) There are two critical paths
- c) A-C-E-H-I
- d) A-C-E-G-I

37) To control the schedule, a project manager is reanalyzing the project to predict project duration. She does this by analyzing the sequence of activities with the least amount of scheduling flexibility. What technique is she using?

- a) Critical path method
- b) Flowchart
- c) Precedence diagramming
- d) Work breakdown structure

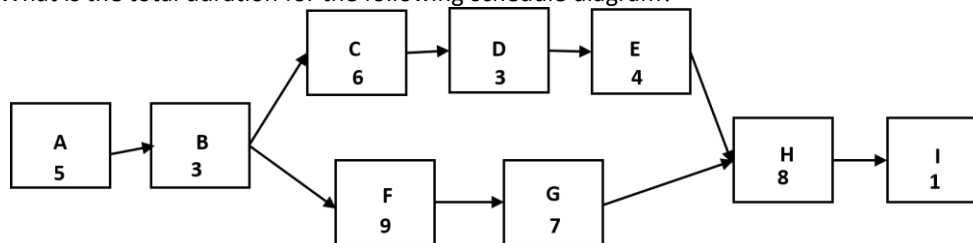
38) Configuration management is:

- a) Used to ensure that the description of the project product is correct and complete.
- b) The creation of the work breakdown structure.
- c) Focuses on monitoring and controlling the specifications for the product or service.
- d) A mechanism to track budget and schedule variances.

39) A rough order of magnitude estimate is made during which project management process group?

- a) Project planning
- b) Project closing
- c) Project executing
- d) Project initiating

40) What is the total duration for the following schedule diagram?



- a) 30
- b) 46
- c) 33
- d) 0

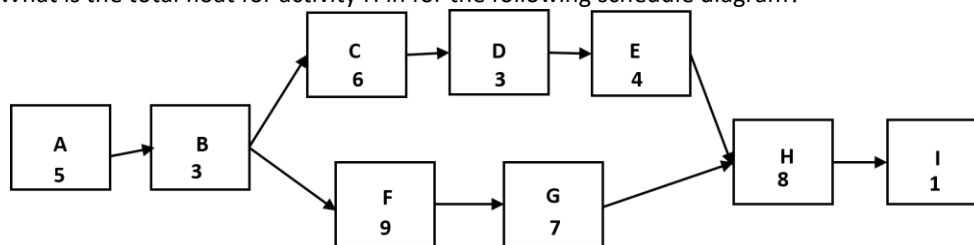
- 41) The lowest level of the Work Breakdown Structure is called the:
- a) Activity.
 - b) Task.
 - c) Work package.
 - d) Cost account.
- 42) All of the following are examples of the cost of nonconformance EXCEPT?
- a) Rework
 - b) Quality training
 - c) Scrap
 - d) Warranty costs
- 43) A project manager has just been assigned to a project. The document that recognizes the existence of the project is called:
- a) The statement of work.
 - b) The project assignment.
 - c) The project charter.
 - d) The product description.
- 44) The WBS for the project represents:
- a) All the tangible items that must be delivered to the client.
 - b) Only the work that needs to be sub-contracted.
 - c) The work that must be executed by the project team.
 - d) All the activities of the project.
- 45) A manager that manages a group of related projects is called a:
- a) Project manager.
 - b) Project expediter.
 - c) Program coordinator.
 - d) Program manager.
- 46) A project manager needs to communicate the needs of his or her personnel requirements and the utilization of each person as well as the assignments that they have in the future. To best accomplish this, what type of document should be used?
- a) Gantt chart
 - b) Network diagram
 - c) Resource Plan
 - d) Responsibility matrix
- 47) A project manager is faced with making a decision about a risk that the team has identified. The risk involves the design of a bicycle. It has been found that the neck of the bicycle, where the steering bearing is located and the two supporting bars of the frame come together, will corrode in a high salt environment. If this takes place the neck may fail and injure the rider. The project team decides that the design of the bicycle should be modified by using corrosion resistant materials in the design of the neck. This will eliminate the risk from consideration. This technique is called:
- a) Risk avoidance.
 - b) Risk acceptance.
 - c) Risk rejection.
 - d) Risk deflection.

- 48) The type of power anyone can earn regardless of their position is:
- a) Referent
 - b) Expert
 - c) Penalty
 - d) Formal
- 49) The contingency budget will:
- a) Reduce the probability of scope changes.
 - b) Reduce the probability of cost overruns.
 - c) Increase the probability of a cost overrun.
 - d) Increase the probability of scope changes.
- 50) A project manager is quantifying risk for her project. Several of her experts are offsite, but wish to be included. How can this be done?
- a) Use Monte Carlo analysis using the Internet as a tool.
 - b) Apply the critical path method.
 - c) Determine options for recommended corrective action.
 - d) Apply the Delphi Technique.
- 51) Managing stakeholder engagement:
- a) is a planning activity
 - b) uses risk management plan as an input
 - c) occurs at the end of the project
 - d) occurs throughout the project life cycle
- 52) The customer calls you to ask about the status of the project, and you have an answer prepared as you are speaking with them. This is an example of:
- a) Meeting customer expectations.
 - b) A project manager is always proactive
 - c) Always keeping a stakeholder with high interest and high influence satisfied.
 - d) Acquiring validation.
- 53) A project manager holds the first risk meeting of the project team. The client is present at the meeting. At the meeting several risks are identified and assigned to members of the project team for evaluation and quantification. The result of the meeting is:
- a) Expected value of the risk events.
 - b) Strategies for the risk events.
 - c) A list of potential risk events.
 - d) General statements about risks for the project.
- 54) A project manager is using weighted average duration estimates to perform schedule network analysis. Which type of mathematical analysis is being used?
- a) Critical path method
 - b) Three-Point Estimate
 - c) Monte Carlo
 - d) Resource leveling

- 55) An activity has an early start (ES) of day 3, a late start (LS) of day 13, an early finish (EF) of day 20, and a late finish (LF) of day 30. The activity:
- a) is on the critical path.
 - b) has a lag.
 - c) has a lead.
 - d) is not on the critical path.
- 56) Conflict resolution techniques that may be used on a project include confronting, smoothing, forcing and:
- a) withdrawing.
 - b) directing.
 - c) organizing.
 - d) controlling.
- 57) Which phase of the project is likely to have the greatest amount of its funding spent?
- a) Initiating
 - b) Executing
 - c) Planning
 - d) Closeout
- 58) A control chart shows seven data points in a row on one side of the mean. What should be done?
- a) Perform a design of experiments.
 - b) Adjust the chart to reflect the new mean.
 - c) Find an assignable cause.
 - d) Nothing. This is the rule of seven and can be ignored.
- 59) The document that is proof of upper management's commitment to the project and gives the authority to manage the project to the project manager is called:
- a) The project plan.
 - b) The project goals and objectives.
 - c) The project charter.
 - d) The project definition.
- 60) Which of the following represents the estimated value of the work actually accomplished?
- a) Earned value (EV)
 - b) Planned value (PV)
 - c) Actual cost (AC)
 - d) Cost variance (CV)
- 61) A project team has completed, and the customer has accepted, the completed project scope. However, the lessons learned required by the project management office have not been completed. What is the status of the project?
- a) The project is incomplete because the project needs to be re-planned.
 - b) The project is incomplete until all project and product deliverables are complete and accepted.
 - c) The project is complete because the customer has accepted the deliverables.
 - d) The project is complete because the project has reached the due date.

- 62) You are the project manager for a project that has high visibility. Your manager wants you to prepare a presentation for him to present at a conference. Most of the material in the presentation will be facts that are the results of your project. Your manager intends to present the material under his own name. Your name will not appear. What should you do?
- Refuse to work on the presentation unless you are listed as a coauthor.
 - Do the work as you were told by your manager.
 - Present your own presentation.
 - Meet with your manager's manager and discuss the problem.
- 63) A project manager works in a company favoring the weakest authority for the project manager. The type of organization that holds the project manager to be the weakest is:
- Projectized organization.
 - Strong matrix organization.
 - Weak matrix organization.
 - Balanced matrix.
- 64) You just found out that a major subcontractor for your project consistently provides deliverables late. The subcontractor approaches you and asks you to continue accepting late deliverables in exchange for a decrease in project costs. This offer is an example of:
- confronting.
 - compromise.
 - smoothing.
 - forcing.

- 65) What is the total float for activity H in for the following schedule diagram?



- 8
 - 32
 - The same as the free float
 - 33
- 66) What information do you need to make a crashing decision?
- Critical path and cost efficiency
 - Critical path only
 - Cost variance for crashing
 - Alternatives analysis
- 67) Which of the following contains Change Management Plan?
- Control scope
 - Communications management plan
 - Configuration management plan
 - Quality management plan

68) These are generally managed by a senior manager or senior management teams.

- a) Project
- b) Portfolio
- c) Program
- d) Tasks

69) Resource leveling will generally:

- a) Reduce the time needed to do the project.
- b) Increase the total time necessary to do all the tasks.
- c) Reduce the overutilization of resources.
- d) Reduce resources to the lowest skill that is possible.

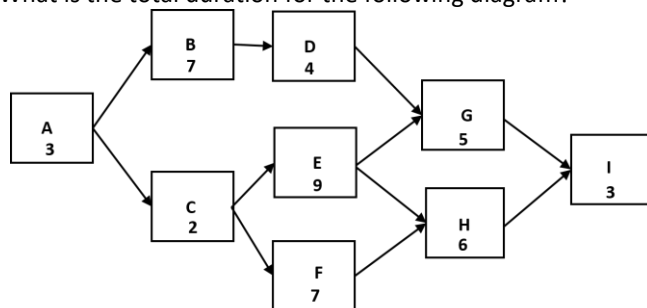
70) Which of the following is considered to be a simulation technique?

- a) PERT analysis
- b) GERT analysis
- c) Monte Carlo analysis
- d) Critical path method

71) Extensive use of ---- communication is most likely to aid in solving complex problems.

- a) verbal
- b) written
- c) formal
- d) nonverbal

72) What is the total duration for the following diagram?



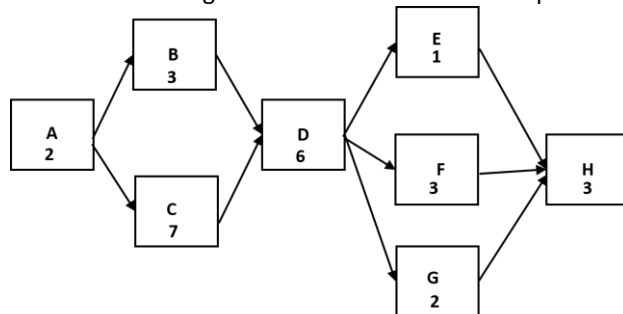
- a) 23
- b) It cannot be determined
- c) 28
- d) 44

73) When checking the calendar of a team member to schedule a meeting, you see she has scheduled a meeting with a key stakeholder that you were not informed of. The best approach would be to:

- a) avoid mentioning it to the team member but continue to watch her activities.
- b) notify your boss about the problem.
- c) address the concern with the team member's boss.
- d) address the concern with the team member.

- 74) The key inputs to Define Activities are:
- Work breakdown structure, the project schedule, and the network diagram.
 - Project schedule, progress reports, and change requests.
 - The project network diagram, constraints, and durations.
 - Scope baseline, enterprise environmental factors, and organizational process assets.
- 75) The customer requests a change to the project that would increase the project risk. Which of the following should you do before all the others?
- Include the expected monetary value of the risk in the new cost estimate.
 - Talk to the customer about the impact of the change.
 - Analyze the impacts of the change with the team.
 - Change the risk management plan.

- 76) Which activities might be considered near critical path on the following schedule diagram?



- B and C
 - A, D, and H
 - E and G
 - C and F
- 77) The lowest level at WBS is one of the following:
- The task.
 - The activity.
 - The work package.
 - The element.
- 78) A project manager would like to manage his project in such a way that he will be able to identify specific tasks that should be watched and managed more closely than others. The project manager should use which method?
- The PERT method
 - The critical path method
 - The GERT method
 - The PCDM method
- 79) What characteristic best describes the cost baseline?
- Total budget for the project
 - Time phased budget for the project
 - Total budget for the project including the contingency budget
 - Total budget for the project including the contingency budget and the management reserve

- 80) In attempting to complete the project faster, the project manager looks at the cost associated with crashing each activity. The best approach to crashing would also include looking at the:
- a) risk impact of crashing each activity.
 - b) customer's opinion of which activities to crash.
 - c) boss's opinion of which activities to crash and in which order.
 - d) project life cycle phase in which the activity is due to occur.
- 81) A project manager has a problem with a team member's performance. What is best form of communication for addressing this problem?
- a) Formal written communication
 - b) Formal verbal communication
 - c) Informal written communication
 - d) Informal interactive verbal communication
- 82) Your employee is three days late with a report. Five minutes before the meeting where the topic of the report is to be discussed, she hands you the report. You notice some serious errors in it. What should you do?
- a) Cancel the meeting and reschedule when the report is fixed.
 - b) Go to the meeting and tell the other attendees there are errors in the report.
 - c) Force the employee to do the presentation and remain silent as the other attendees find the errors.
 - d) Cancel the meeting and rewrite the report yourself.
- 83) Which of the following is not a justification for performing quantitative risk analysis?
- a) Complexity
 - b) Massive scale
 - c) Strategic importance
 - d) The EMV required
- 84) The act of doing anything that will help to bring future project performance into line with the project plan is called:
- a) Budget update.
 - b) Revised cost estimate.
 - c) Corrective action.
 - d) Contingency planning.
- 85) A project is engaged in making electronic devices. It is necessary for them to purchase materials to make the printed circuit boards. All of the parts are common parts that are available from several vendors. The most likely contract that should be issued for these parts is:
- a) Unit price contract.
 - b) Fixed price contract.
 - c) Cost reimbursable contract.
 - d) Award fee contract.

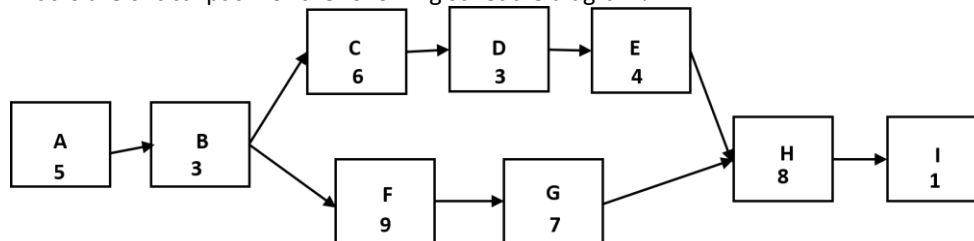
86) You are the project manager for a large project that is completed on time and on budget. The customer and all of the stakeholders are pleased with the results. As a direct result of the successful completion of the project, your manager approves a bonus of \$25,000 to you. There are fifteen members of the project team. One of the people on the project team has been a very low contributor to the project; the other fourteen have all been above standard. What should you do with the money?

- a) Keep the money yourself; you deserve it, and the manager gave it to you.
- b) Divide the money equally among all the team members.
- c) Ask the team members how they would divide the money.
- d) Divide the money equally among the team members except for the substandard team member.

87) A project manager is using a cause and effect diagram with the team to determine how various factors might be linked to potential problems. In what part of the quality management process is the project manager involved?

- a) Quality analysis
- b) Perform quality assurance
- c) Control quality
- d) Quality audits

88) What is the critical path for the following schedule diagram?



- a) A-B-C-F-G-H-I
- b) A-B-F-G-H-I
- c) A-B-C-D-E-H-I
- d) A-B-H-I

89) During which risk management process is a determination to transfer a risk made?

- a) Identify risks
- b) Perform quantitative risk analysis
- c) Plan risk response planning
- d) Control risks

90) At the request of the project team for a large project, the company's purchasing department advertises that they intend to let a contract for construction work associated with the project. This is called:

- a) Procurement planning.
- b) Solicitation.
- c) Advertising.
- d) The procurement process.

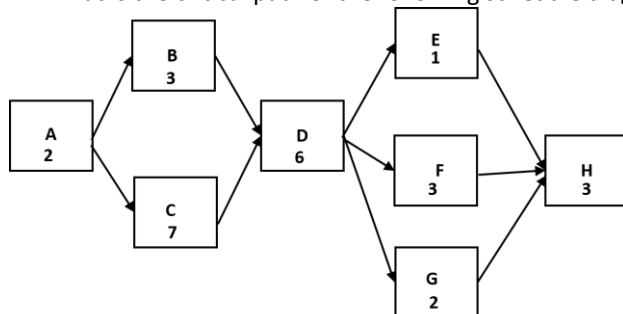
91) A project is considered complete when the :

- a) BAC is equal to the PV.
- b) The EV is equal to the AC.
- c) The PV is equal to the AC.
- d) The BAC is equal to the EV.

- 92) What does the term “progressive elaboration” refer to?
- a) Constantly changing project scope.
 - b) Gaining additional clarity and detail of project deliverables as the project moves through the project lifecycle.
 - c) Letting team members make scope changes without customer approval.
 - d) Is only used where environments are uncertain.
- 93) Communication styles assessment is not new to the work place or projects, although with the expansion of interpersonal styles as a project management skill, related tools have become more prominent. One of the first tools for this purpose was developed by William Moulton in 1928. DISC stands for:
- a) Dominance, Interest, Strength, Commitment
 - b) Definitive, Important, Superior, Cautious
 - c) Dominance, Influence, Steadiness, Conscientiousness
 - d) Defiance, Influence, Steadfastness, Caution
- 94) What is the difference between quality and grade?
- a) They are the same.
 - b) Quality can be precise, while grade means inherent characteristics with the same function.
 - c) Quality may be perceived while grades are always scored.
 - d) Quality is about attributes and grade is about tolerances.
- 95) The best definition of a risk report is?
- a) To catalog and prioritize risk events
 - b) To store high level risk information for communication purposes.
 - c) An output from implement risk response for sharing status of the effort.
 - d) To identify and communicate risk ownership
- 96) Other labels for an Ishikawa diagram include all of the following except:
- a) Fishbone diagram
 - b) Cause and effect diagram
 - c) Pareto diagram
 - d) Root cause analysis
- 97) Choose the correct description regarding the technical skills of a project manager.
- a) Technical skills of a project manager must be sufficiently high to understand technical issues and explain technical decisions to others.
 - b) Technical skills of a project manager must be equal to or higher than any other team member’s technical skills.
 - c) Technical skills of a project manager should not be considered when selecting a project manager.
 - d) Technical skills of a project manager are the most important criteria for selecting a project manager.
- 98) Managing stakeholder engagement is usually the responsibility of:
- a) The project sponsor
 - b) The performing organization
 - c) The project team
 - d) The project manager

- 99) What is the main purpose of the decomposition process?
- Document results of lessons learned.
 - Break down project deliverables into component activities.
 - Estimate costs and duration for each sub-project.
 - Allocate resources to each activity.
- 100) Which component is a graphical representation of the deliverables included in the project?
- Resource assignment matrix.
 - Work breakdown structure.
 - Organizational breakdown structure.
 - Project schedule.
- 101) The critical path is established by calculating the following dates:
- Start-to-start, start-to-finish, finish-to-finish, finish-to-start.
 - Early start, early finish, late start, late finish.
 - Predecessor-to-successor, predecessor-to-predecessor, successor-to-successor.
 - Primary-to-secondary, primary-to-finish, secondary-to-secondary, finish-to-finish.
- 102) What is meant by near-critical activity?
- An activity that is on the critical path.
 - An activity that may have higher risk to the project due to less risk mitigation than activities on the critical path.
 - An activity that is not on the critical path but has low total float.
 - An activity that has the longest duration.
- 103) Choose the appropriate term that corresponds to “analogous estimating.”
- Bottom-up estimating
 - Simulation
 - Form of expert judgment
 - Heuristics

- 104) What is the critical path of the following schedule diagram?



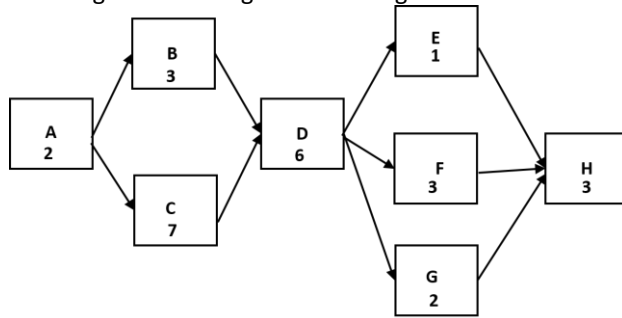
- All activities are on the critical path
- A-B-D-E-H
- A-C-D-F-H
- A-B-D-G-H

- 105) Benchmarking can help determine:
- a) When to launch a new product.
 - b) Marketing sales costs associated with a specific product.
 - c) What processes are used by other organizations to achieve customer satisfaction?
 - d) When to request a quality audit.
- 106) What does this description define: “An interrelationship diagram into which probabilities are placed and a simulation performed”?
- a) A monte Carlo simulation
 - b) An influence diagram
 - c) A mind map
 - d) A model
- 107) Which tool is consistently used to document the roles and responsibilities on a project?
- a) Role administration matrix
 - b) Responsibility assignment matrix
 - c) Responsibility and role hierarchy
 - d) Staffing management plan
- 108) An alternative to a procurement SOW is an?
- a) RFQ
 - b) SASS
 - c) SLA
 - d) TOR
- 109) Who is the quality guru associated with “Plan-Do-Check-Act”?
- a) Taguchi
 - b) Deming
 - c) Juran
 - d) Crosby
- 110) In which organizational structure does the project manager have the most authority?
- a) Weak matrix
 - b) Strong matrix
 - c) Functional structure
 - d) Projectized structure
- 111) The risk response that can be categorized as either passive or active is:
- a) Risk avoidance.
 - b) Risk mitigation.
 - c) Risk acceptance.
 - d) Risk transference.
- 112) What does colocation mean?
- a) That the team members are distributed geographically.
 - b) That the team is located in one physical location.
 - c) That the team uses a war room.
 - d) The team member works from home

- 113) Quality audits could take place:
- a) Only at the end of the project
 - b) Only for projectized projects
 - c) At random intervals over the course of the project.
 - d) At the beginning of the project
- 114) Stakeholder relationships and interactions might best be represented with a:
- a) Mind map
 - b) Flow chart
 - c) RACI diagram
 - d) Organization chart
- 115) The five stages of team development are:
- a) Forming, storming, norming, performing and adjourning.
 - b) Initiation, sharing, bonding, coordinating and performing.
 - c) Forming, communicating, structuring, acceptance, and recognition.
 - d) Creation, conflict, communicating, accepting and completion.
- 116) Imperfect knowledge is also referred to as ambiguity risk. Which of the following tools would least likely help to address ambiguity risk?
- a) Expert judgement
 - b) Delphi Technique
 - c) Benchmarking
 - d) Nominal Group Technique
- 117) Which are tools and techniques for the conduct procurement process?
- a) Bidder conferences, SWOT analysis, independent estimates, expert judgment.
 - b) Procurement negotiations, advertising, contingent response strategies, proposal evaluation techniques.
 - c) Independent estimates, make-or-buy decisions, qualified seller lists, source selection criteria.
 - d) Bidder conferences, independent estimates, expert judgment, procurement negotiations.
- 118) Which statement best describes the project controlling process?
- a) Is used strictly to control scope changes.
 - b) Is used by the project team throughout the project.
 - c) Is used only in the control phase of the project.
 - d) Is used to control changes made as a result of project planning and execution.
- 119) What is scope creep?
- a) Reduction of project scope.
 - b) A type of residual risk.
 - c) Unmanaged changes to the project scope.
 - d) An activity that needs to be included in the project schedule.

- 120) Which of these is a collection of formal, documented procedures that define the steps by which the project may be changed?
- a) Managing by objective
 - b) Change control system
 - c) Managing by exception
 - d) Configuration management
- 121) A _____ is an administrative unit that supervises and coordinates the management of all projects in an organization.
- a) CEO
 - b) CIO
 - c) CFO
 - d) PMO
- 122) Which statement best describes a program?
- a) A strategy for dealing with project risks.
 - b) Two or more phases of a project.
 - c) A collection of related projects managed in a coordinated way.
 - d) A centralized, permanent, ongoing administrative unit.
- 123) Which of the following is not a leadership characteristic?
- a) Change the status quo
 - b) Ask what and why
 - c) Inspire trust
 - d) Do things right
- 124) Which of the following is not a common project output?
- a) Lessons Learned
 - b) Retrospectives
 - c) Enterprise Environmental Factors
 - d) Lesson Learned Register
- 125) Your project is in the process of being formally authorized. What is the name of the document indicating that you have been assigned as the project manager?
- a) Project management plan
 - b) Project charter
 - c) Project scope statement
 - d) Work breakdown structure

126) Using the following schedule diagram what is the duration of activity H?



- a) 21
- b) 0
- c) 3
- d) Calculated by LF-LS

127) What is the purpose of the scope management plan?

- a) To list all of the tasks that will be included in the project.
- b) To prevent scope creep by ensuring that all changes to a project plan be reviewed by a review board.
- c) To identify how the project's scope will be defined, verified, and controlled when changes are proposed.
- d) To archive all of the information in WBS, RBS, and PBS.

128) Which process involves defining and documenting the stakeholders' needs and expectations to meet the project objectives?

- a) The define scope process.
- b) The develop project management plan process.
- c) The collect requirements process.
- d) The create WBS process.

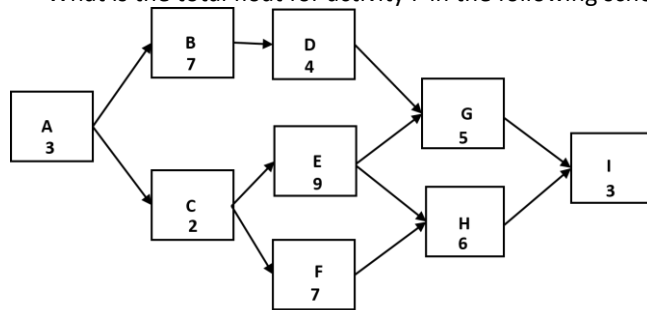
129) A customer knows more about what they do not want than what they do want. Which of the following approaches would least assist with your project effort?

- a) A mockup
- b) A small scale product
- c) Nominal Group Technique
- d) Simulation

130) Parametric estimates are most likely to be accurate when all of the following statements are true *except*:

- a) The historical information is accurate.
- b) The project manager creates the model without input from other stakeholders.
- c) The parameters used in the model are readily quantifiable.
- d) The model is scalable.

131) What is the total float for activity F in the following schedule diagram?



- a) 7
- b) 14
- c) 2
- d) 0

132) What does collocation mean?

- a) That the team members are distributed geographically.
- b) That the team is located in one physical location.
- c) That the team uses a war room.
- d) The team member works from home.

133) Training is an activity which:

- a) Is best done in 3-day increments.
- b) Provides team members a means to acquire new or enhanced skills.
- c) Is also known as team building.
- d) Reduces team conflict.

134) When is BAC equal to EAC?

- a) When the project meets objectives.
- b) When the cost and schedule exactly match the plan.
- c) When the PV is met.
- d) When the EV is met.

135) Team-building can be beneficial to improving team performance. Of the team development stages, which stage is team-building considered to be the most helpful?

- a) Performing
- b) Storming
- c) Norming
- d) Adjourning

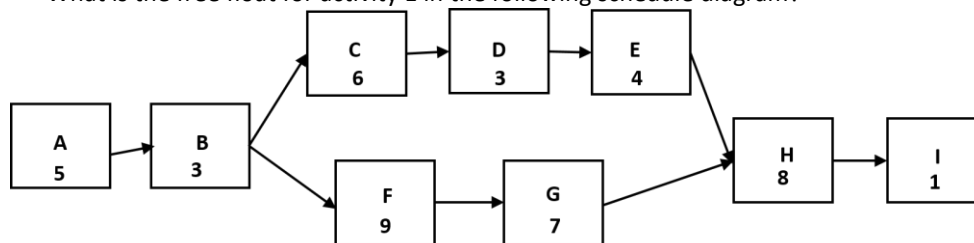
136) The 100% rule requires that ...

- a) 100% of the work must be completed before it can be recognized.
- b) The WBS must be fully decomposed before work may begin.
- c) All objectives must have at least one work package, and all work package must reflect the value of at least one objective.
- d) All stakeholders must fully commit to their accountability for the project to be successful.

- 137) In order to track deliverable components that may not have schedule elements, a project manager might apply a _____.
- Work package.
 - Control account.
 - Planning package.
 - Milestone chart.

- 138) Which of the following resource control methods will likely extend the Total Duration of the project?
- Leads
 - Leveling
 - Smoothing
 - Lags

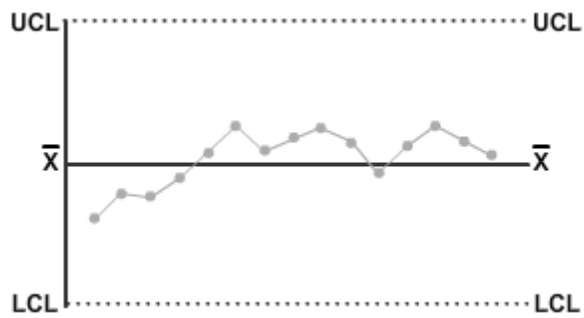
- 139) What is the free float for activity E in the following schedule diagram?



- 0
 - 4
 - 3
 - 21
- 140) What are the two schedule compression techniques—fast tracking and crashing—used for?
- Planning activity sequence.
 - Shortening total project schedule duration.
 - Developing an activity schedule.
 - Estimating activity duration.
- 141) Why should you always fast track before crashing?
- Because it always goes faster.
 - Because there is no risk.
 - Because you are not expending additional resources.
 - Because it is always the easier solution to determine.
- 142) When looking at a crash plot, which activity would you elect to crash first?
- The first activity listed on the left.
 - The activity with the greatest slope.
 - The activity with the least total cost.
 - The activity listed farthest to the right.

- 143) Your project has a total budget of \$600,000. You have completed 75% of the work. Your bookkeeper suggests that you have spent \$400,000. What is your TCPI?
- a) .75
 - b) .25
 - c) \$450,000
 - d) \$200,000
- 144) Which are the reasons that make variance to be sporadic, unusual, and difficult to predict?
- a) Random causes
 - b) Common causes
 - c) Special causes
 - d) External causes
- 145) As a member of the Quality Control department it is your responsibility to teach entry-level courses to all technical personnel. In this course, one of the ideas that must be addressed is tolerances versus control limits. Which statement below is *true*?
- a) Tolerances should be tighter than control limits
 - b) A data point may be outside of the control limits, but still inside of the tolerances
 - c) Your customer usually sets the control limits
 - d) Your process or equipment usually sets the tolerances
- 146) "500 rejected parts" is an example of which sampling technique?
- a) Attribute sampling
 - b) Variable sampling
 - c) Random sampling
 - d) Stratified sampling
- 147) Which chart is ordered by frequency of categorized causes of poor quality performance?
- a) A control chart
 - b) A fishbone diagram
 - c) A Pareto diagram
 - d) A trend analysis

148) The graphic is an example of which diagram/chart?



- a) A control chart
- b) A fishbone diagram
- c) A Pareto diagram
- d) A cause-and-effect diagram

149) Which of the following is least likely a form of Quality planning based data representation?

- a) A flowchart
- b) A state diagram
- c) A matrix diagram
- d) An affinity diagram

150) All of the following are matrix diagram formats except?

- a) Decision tree
- b) L,Y,T,X,C
- c) A spreadsheet
- d) Roof shaped

151) DfX stands for?

- a) Planning for quality during product design
- b) Statistical quality analysis formulas
- c) Risk Factors affecting design
- d) Design of Experiments

152) Which of the following is an open question?

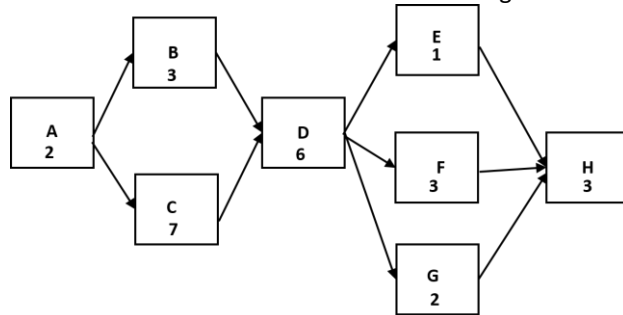
- a) How old are you?
- b) May I open the door for you?
- c) What time is it?
- d) Where would you like to meet?

153) Jennifer is a publisher. In order to make sure that she controls project costs, she issues a fixed price contract to her writer. Jennifer is using which risk response?

- a) Risk avoidance.
- b) Risk mitigation.
- c) Risk acceptance.
- d) Risk transference.

- 154) The purpose of a risk response audit is:
- a) To examine the ability of the team to meet its quality objectives.
 - b) To examine the effectiveness of the team's risk response plans.
 - c) To determine if the team is on budget and on schedule.
 - d) To revise the risk register.
- 155) Another term for Modeling is ...
- a) Prototyping
 - b) What if analysis
 - c) Diagramming
 - d) Simulation
- 156) Your risk response plan is not prepared to handle an event that suddenly looks like the impact will exceed contingency. Your first effort should be to?
- a) Fallback
 - b) Actively accept
 - c) Escalate
 - d) Mitigate
- 157) One form of Risk Identification is eliciting information from key stakeholders using prompt lists. All of the following are common project management prompt lists except?
- a) PESTLE
 - b) TECOP
 - c) SCADA
 - d) VUCA
- 158) The final L and E in PESTLE stand for?
- a) Economic, Lateral
 - b) Environmental, Legal
 - c) Education, Legal
 - d) Escalation, Legal
- 159) Which document sent to prospective sellers provides information regarding the requirement specifications and needs of your project?
- a) Procurement management plan
 - b) Project documents
 - c) Procurement document
 - d) Request for information

160) What is the total duration for the following schedule diagram?



- a) 21
- b) 3
- c) 27
- d) 24

161) Some specific types of procurement administration issues are:

- a) Team motivation and conflict.
- b) Ways to develop the project team.
- c) Legal issues, warranties and waivers.
- d) Understanding and managing environmental factors.

162) Which statement is true of the contract change control system?

- a) Belongs to the seller rather than the project organization.
- b) Contains all of the forms, performance tracking, and procedural information needed to deal with contract changes.
- c) Does not feed information into the project's change control system.
- d) Does not include procedures for reviewing and resolving contract disputes.

163) At some point in the project, a risk may be beyond the scope of the risk owner to react. The best form of risk response in this situation would be?

- a) Passive acceptance
- b) Escalation
- c) Mitigation
- d) Enhancement

164) Contract performance milestones can be:

- a) Delivery trends.
- b) Completion of selected portions of the project work.
- c) Budget variance.
- d) Risk analysis results.

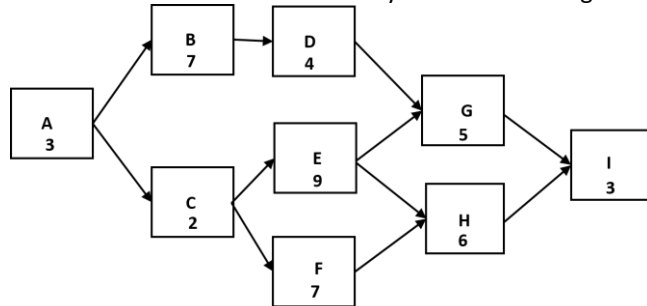
165) Which process is concerned with managing supplier relationships?

- a) Administer procurements
- b) Solicitation management
- c) Supplier selection
- d) Procurement planning

- 166) Termination of a contract may occur for all of the following reason *except*:
- Completion
 - Cause
 - Mutual agreement
 - Convenience
- 167) When can a contract close-out occur:
- At the end of a project only.
 - Whenever a contract is completed and accepted.
 - At the end of a project only, unless the project is terminated early.
 - Whenever the supplier submits an invoice.
- 168) You use earned value management to check your Agile project. Your SPI is .65 and your CV is 1.2. What is the status of the project?
- You are ahead of schedule and over budget.
 - You are ahead of schedule and under budget
 - You are over budget and behind schedule.
 - You are behind schedule and under budget.
- 169) The purpose of a procurement audit is:
- to provide a formal evaluation of the procurement process and seller's performance
 - to identify weaknesses in the seller's work processes
 - to document the effectiveness of risk responses in dealing with identified risks and their root causes as well as the effectiveness of risk management processes
 - to review processes from plan procurement process through the administer procurement process
- 170) All of the following are Procurement Delivery Types except...
- DB
 - DBB
 - DBA
 - BOOT
- 171) When negotiating procurements, you may sometime allow the seller to hire additional services or providers in order to complete their contract to you. What do you call this form of procurement?
- Services provider acts as representative
 - Seller joint venture
 - Services provider with subcontracting allowed
 - Services with no subcontracting
- 172) As you review potential sellers, the business analyst on your team performs financial analysis of the alternatives and reports using NPV. Which of the following bids should you best consider?
- A product who current value is \$60,000.
 - A product whose value will be \$60,000 when the work is completed.
 - A product whose current value is \$45,000 but whose eventual value will be \$61,000.
 - A product whose cost will be \$75,000 over the next three years.

- 173) You need to order 2,000 ping pong balls for a recreation of the Captain Kangaroo show. If the show is a success, you need to be able to assure that the seller will remain in business throughout the show's run. Which type of procurement bid document would you use?
- a) RFQ
 - b) IFB
 - c) RFI
 - d) RFP
- 174) Who is responsible for ensuring that changes are processed through the integrated change control process?
- a) Project sponsor
 - b) President
 - c) Project manager
 - d) Functional manager
- 175) What is true of lessons learned during the project?
- a) Should be documented only in the closeout report.
 - b) Should consist of only project data.
 - c) Should be documented throughout the project.
 - d) Should consist of only things that went well during project execution.
- 176) The total budget for your project is \$300,000. The actual cost when you inherit the project as manager is \$160,000. Your evaluation with the team suggests that you will need to spend \$200,000 to complete all of the project effort. What is EAC and what is VAC?
- a) \$200,000 and \$100,000
 - b) \$360,000 and \$60,000
 - c) \$300,000 and \$40,000
 - d) \$300,000 and \$200,000
- 177) Validate Scope is a process that ...
- a) Confirms conformance to plan.
 - b) Acquires formal acceptance from the customer.
 - c) Applies results from a Quality Audit.
 - d) Requires work performance information.
- 178) Project Knowledge Management includes all of the following personal skills except?
- a) Leadership
 - b) Networking
 - c) Conflict resolution
 - d) Active Listening
- 179) A synonym for Tacit might include?
- a) Codified
 - b) Private
 - c) Factual
 - d) Documented

180) What is the free float for activity B in the following schedule diagram?



- a) 1
- b) 0
- c) 7
- d) 11

181) When a change control board marks a suggestion as “MIR”, what do they mean?

- a) The change should be sent into space.
- b) Insufficient information to determine how best to proceed.
- c) The suggestion crashed and burned.
- d) Approved with a “must implement report” required.

182) What is the difference between a regulation and a standard?

- a) Standards must always be met.
- b) Failing to meet a regulation may result in penalties.
- c) A regulation is a form of standard
- d) Standards are designed for excellence, regulations are goals.

183) The primary tool of a business analyst to confirm product value during a project is?

- a) Inspection
- b) Traceability Matrix
- c) Elicitation
- d) Analysis

184) Within agile projects, all team members participate in quality control throughout the project. One of the tools they may use for this purpose is?

- a) Retrospectives
- b) Iterations
- c) Control charts
- d) Checksheets

185) Which of the following emotional intelligence characteristics would be considered outbound?

- a) Self-awareness
- b) Relationship management
- c) Maturity
- d) Self-management

186) Which of the following is the definition of a team charter?

- a) The project is assigned to a team instead of a project manager.
- b) Assignments provided to the team by the scrummaster and product owner.
- c) Goals set by the team to assist with meeting common objectives.
- d) The work the team elects to perform per iteration or sprint.

- 187) One of the most important tools when selecting internal or external resources might be?
- a) The RAM
 - b) The Organizational Structure
 - c) Multi-criteria decision analysis
 - d) Interviews
- 188) You have been tasked with putting together a multi-national, cross cultural project team. What would be one of your first considerations?
- a) The budget
 - b) Virtual teams
 - c) The communication model
 - d) Colocation
- 189) One of the important considerations used when developing teams is a model called:
- a) Hierarchy of Needs
 - b) Tuckman Ladder
 - c) Theory X and Y
 - d) Blake-Mouton
- 190) Which of the following is not a PMIS?
- a) A file cabinet
 - b) Microsoft SharePoint
 - c) A notebook
 - d) Lessons learned register
- 191) Written communication should always be all of the following except:
- a) Concise
 - b) Clear
 - c) Coherent
 - d) Collaborative
- 192) Agile projects raise additional challenges within the area of communications. Which of the following is the least important agile project cycle component?
- a) Colocation
 - b) Frequent checkpoints
 - c) Validation
 - d) Transparent artifacts
- 193) Not all risks are related to 'events'. Other categories of risks might be related to uncertainty or variability. One tools used to help resolve related risks might be:
- a) Monte-Carlo analysis
 - b) Alternatives analysis
 - c) Performance reviews
 - d) Trend analysis
- 194) During which risk process group are risk owners confirmed?
- a) Risk identification
 - b) Quantitative risk analysis
 - c) Qualitative risk analysis
 - d) Identify Resources

195) Some of the largest drivers pulling contract management away from project management include all of the following except:

- a) Governance
- b) Mega projects
- c) Flow of materials and handoffs
- d) Regulations

196) Agile considerations for stakeholder engagement include all of the following except:

- a) Dynamic co-creation
- b) Aggressive Transparency
- c) Public meetings and posting
- d) Focal point of contact

197) Given the following crash table, which activity would you crash first?

	Crash week	Crash cost (\$K)	Crash/week
A	4	15	3.75
B	2	22	11
K	1	9	9
N	3	12	4
W	4	18	4.5

- a) A
- b) B
- c) K
- d) N

198) The team has worked long hours the last several weeks to meet the customer's desired deadline. Ninety percent of the work is complete, and 86% of the project's \$200,000 budget has been spent. What is the TCPI?

- a) .71
- b) 1.11
- c) 1.04
- d) \$20,000

199) All of the following are specific Agile terms except:

- a) Backlog
- b) Retrospective
- c) Kanban
- d) Iteration

200) You are in a meeting the project sponsor, the customer, and a few core team members when the customer identifies that the product you plan to deliver will not meet their needs. A team member identifies the problem as a requirement missed during initial planning. The sponsor identifies that all contract elements have been completed. The customer does not want to pay for the product. With whom do you side in this discussion?

- a) The sponsor.
- b) The key team member.
- c) The customer.
- d) You set a new direction entirely.

SAMPLE EXAM ANSWERS

SAMPLE PMP EXAM QUESTIONS – 6TH EDITION PMBOK GUIDE® – ANSWERS

- 1) Risks will be identified during which risk management process(es)?
 - a) Quantitative risk analysis and risk identification
 - b) Risk identification and control risks
 - c) Qualitative risk analysis and risk monitoring and control
 - d) Risk identification**

- 2) The highest point of Maslow's hierarchy of needs is:
 - a) physiological satisfaction.
 - b) attainment of survival.
 - c) need for association.
 - d) Self-actualization.**

- 3) Who is ultimately accountable for quality management on the project?
 - a) Project engineer
 - b) Project manager**
 - c) Quality manager
 - d) Team member

- 4) A heuristic is best described as a:
 - a) control tool.
 - b) scheduling method.
 - c) planning tool.
 - d) rule of thumb**

- 5) If earned value (EV) = 350, actual cost (AC) = 400, planned value (PV) = 325, what is cost variance (CV)?
 - a) 350
 - b) -75
 - c) 400
 - d) -50**

- 6) A project manager has just been assigned to a new project and has been given the preliminary project scope statement and the project charter. The first thing the project manager must do is:
 - a) create a project scope statement.
 - b) confirm that all the stakeholders have had input into the scope.
 - c) analyze project risk.
 - d) begin work on a project management plan.**

- 7) The project manager is making sure that the product of the project has been completed according to the project management plan. What part of the project management process is he in?
 - a) Planning
 - b) Executing
 - c) Monitoring and controlling**
 - d) Closing

- 8) A project manager is employed by a construction company and is responsible for the furnishing of the completed building. One of the first things that the project manager for this project should do is to write a:
 - a) Work breakdown structure.
 - b) Budget baseline.
 - c) Project charter.**
 - d) Project plan.

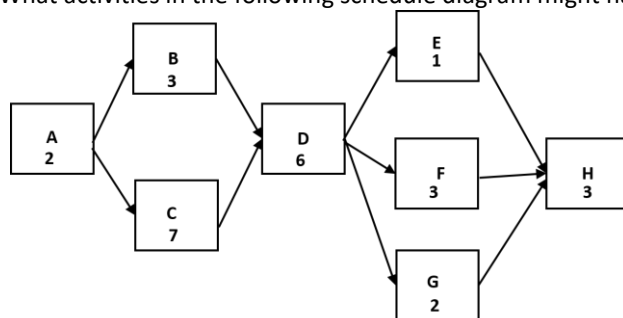
9) Your company has an emergency and needs contracted work done as soon as possible. Under these circumstances, which of the following would be the helpful to add to the contract?

- a) A clear contract statement of work
- b) Requirements as to which subcontractors can be used
- c) **Incentives**
- d) A force majeure clause

10) The "halo effect" refers to the tendency to:

- a) promote from within.
- b) hire the best.
- c) **move people into project management because they are good in their technical fields.**
- d) move people into project management because they have project mgt training.

11) What activities in the following schedule diagram might have free float?



- a) Only a few
- b) **Without calculating, B, C, E, F, or G**
- c) Only activities on the critical path
- d) A, D, H

12) A project manager is trying to complete a software development project, but cannot get enough attention for the project. Resources are focused on completing process-related work and the project manager has little authority to properly assign resources. What form of organization must the project manager be working in?

- a) **Functional**
- b) Matrix
- c) Expediter
- d) Coordinator

13) All of the following are characteristics of a project EXCEPT:

- a) Temporary
- b) Definite beginning and end
- c) Interrelated activities
- d) **Repeats itself every month**

14) During an Agile project life cycle, a tool used to measure the tasks remaining is called:

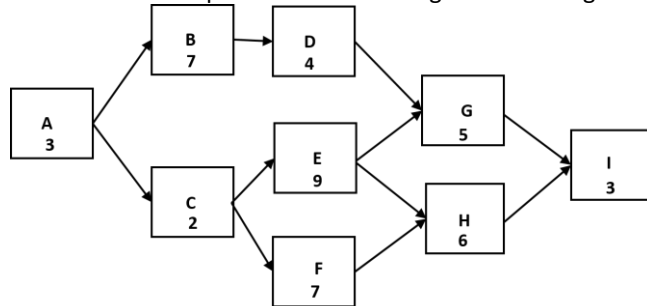
- a) A Kanban Board
- b) The backlog
- c) **A burndown chart**
- d) The user story register

- 15) The equivalent of cost reimbursable contracts is frequently termed:
- a) Back charge contracts.
 - b) Fixed price contracts.
 - c) Progress payment contracts.
 - d) **Cost plus contracts.**
- 16) A buyer extends a formal invitation to prospective sellers seeking their response that will describe the methodology and concept solutions for the buyer. This is called:
- a) Invitation to bid.
 - b) Request for information.
 - c) **Request for proposal.**
 - d) Request for bid.
- 17) A project manager must have some work done by an outside contractor. This work has a great deal of risk associated with it, and it has become very difficult to find a contractor willing to take on the job. Which of the following types of contract would offer the greatest incentive to the contractor?
- a) **Cost plus incentive fee**
 - b) Cost plus fixed fee
 - c) Fixed price incentive fee
 - d) Firm fixed price
- 18) Purchasing insurance is considered an example of risk:
- a) mitigation.
 - b) **transfer.**
 - c) acceptance.
 - d) avoidance.
- 19) A cost performance index (CPI) of 0.89 means:
- a) at this time, we expect the total project to cost 89 percent more than planned.
 - b) when the project is completed we will have spent 89 percent more than planned.
 - c) the project is only progressing at 89 percent of that planned.
 - d) **the project is only getting 89 cents out of every dollar invested.**
- 20) In the matrix management organization, which of the following is true?
- a) The project manager is responsible for employee skills improvement.
 - b) **The functional manager is responsible for employee skills improvement.**
 - c) The project manager is responsible for the employee's annual appraisal.
 - d) The employee is responsible for his or her own skills improvement.
- 21) Your program manager has come to you, the project manager, for help with a bid for her newest project. You want to protect your company from financial risk. You have limited scope definition. What is the BEST type of contract to choose?
- a) Fixed price (FP)
 - b) Cost plus percent of cost (CPPC)
 - c) Time and material (T&M)
 - d) **Cost plus fixed fee (CPFF)**

- 22) The project management process groups are:
- a) Initiating, planning, expediting, and control.
 - b) Plan, organize, develop, and control.
 - c) Plan, do, observe, commit.
 - d) **Initiating, planning, executing, controlling, and closeout.**
- 23) In which project management process group is the detailed project budget created?
- a) Initiating
 - b) Before the project management process
 - c) **Planning**
 - d) Executing
- 24) Which of the following conflict resolution techniques will generate the MOST lasting solution?
- a) Forcing
 - b) Smoothing
 - c) Compromise
 - d) **Problem solving**
- 25) Which of the following best describes decomposition?
- a) Waiting for a task to expire so that it can break down into smaller tasks.
 - b) **Taking a deliverable and breaking it down into the smaller work packages so that it can be organized and planned.**
 - c) Categorizing work packages.
 - d) Dividing work packages into deliverables that can be planned for.
- 26) Any numbering system that is used to monitor project costs by category such as labor, supplies, or materials, for example, is called:
- a) **Code of accounts.**
 - b) Work breakdown structure.
 - c) Universal accounting standard.
 - d) Standard accounting practices.
- 27) Which of the following is NOT an input to the initiating process group?
- a) Company processes
 - b) The company culture
 - c) Historical WBSs
 - d) **Project scope statement**
- 28) A schedule performance index (SPI) of 0.76 means:
- a) you are over budget.
 - b) you are ahead of schedule.
 - c) **you are only progressing at 76 percent of the rate originally planned.**
 - d) you are only progressing at 24 percent of the rate originally planned.
- 29) An output of Close Project is the creation of:
- a) **project archives.**
 - b) a project charter.
 - c) a project management plan.
 - d) a risk analysis plan.

- 30) A temporary endeavor undertaken to create a new product or service is called a:
- a) New product development.
 - b) Project.**
 - c) Program.
 - d) Enterprise.
- 31) Relative to resource estimating, how are smoothing and leveling related?
- a) Smoothing is another term for resource leveling
 - b) Smoothing averages resources across time
 - c) Leveling maintains the critical path, but smoothing doesn't
 - d) Smoothing maintains the critical path, but leveling doesn't**
- 32) An example of scope validation is:
- a) Reviewing the performance of an installed software module.**
 - b) Managing changes to the project schedule.
 - c) Decomposing the WBS to a work package level.
 - d) Performing a benefit-cost analysis to determine if we should proceed.
- 33) What conflict resolution technique is a project manager using when he says, "I cannot deal with this issue now!"
- a) Problem solving
 - b) Forcing
 - c) Withdrawal**
 - d) Compromising
- 34) Approved change requests is an input to:
- a) Control Scope and Validate Scope.
 - b) Direct and manage project work and perform integrated change control.**
 - c) Develop project management plan and develop project charter.
 - d) Develop project management plan and schedule development.
- 35) A group of related projects that are managed in a coordinated way that usually include an element of ongoing activity is called a:
- a) Major project.
 - b) Project office.
 - c) Program.**
 - d) Group of projects.

36) What is the critical path for the following schedule diagram?



- a) A-B-D-G-I
- b) There are two critical paths
- c) **A-C-E-H-I**
- d) A-C-E-G-I

37) To control the schedule, a project manager is reanalyzing the project to predict project duration. She does this by analyzing the sequence of activities with the least amount of scheduling flexibility. What technique is she using?

- a) **Critical path method**
- b) Flowchart
- c) Precedence diagramming
- d) Work breakdown structure

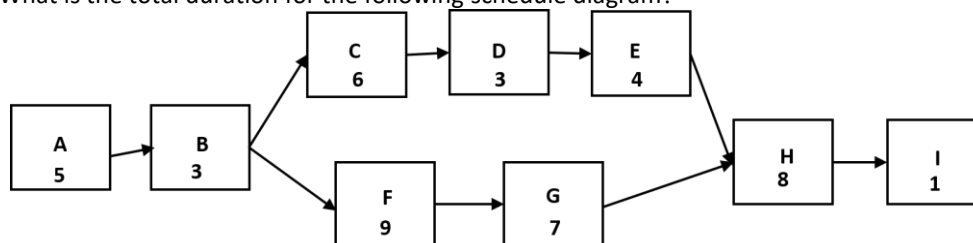
38) Configuration management is:

- a) Used to ensure that the description of the project product is correct and complete.
- b) The creation of the work breakdown structure.
- c) **Focuses on monitoring and controlling the specifications for the product or service.**
- d) A mechanism to track budget and schedule variances.

39) A rough order of magnitude estimate is made during which project management process group?

- a) Project planning
- b) Project closing
- c) Project executing
- d) **Project initiating**

40) What is the total duration for the following schedule diagram?



- a) 30
- b) 46
- c) **33**
- d) 0

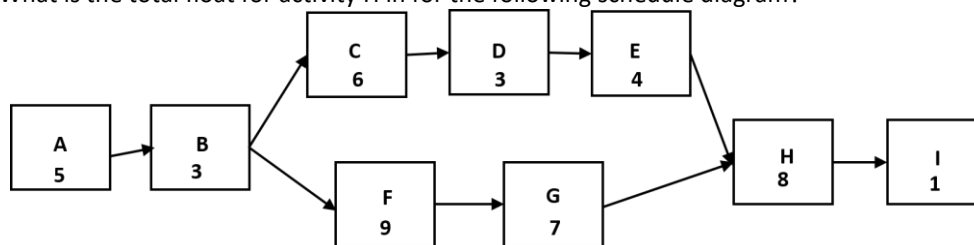
- 41) The lowest level of the Work Breakdown Structure is called the:
- a) Activity.
 - b) Task.
 - c) **Work package.**
 - d) Cost account.
- 42) All of the following are examples of the cost of nonconformance EXCEPT?
- a) Rework
 - b) **Quality training**
 - c) Scrap
 - d) Warranty costs
- 43) A project manager has just been assigned to a project. The document that recognizes the existence of the project is called:
- a) The statement of work.
 - b) The project assignment.
 - c) **The project charter.**
 - d) The product description.
- 44) The WBS for the project represents:
- a) All the tangible items that must be delivered to the client.
 - b) Only the work that needs to be sub-contracted.
 - c) **The work that must be executed by the project team.**
 - d) All the activities of the project.
- 45) A manager that manages a group of related projects is called a:
- a) Project manager.
 - b) Project expediter.
 - c) Program coordinator.
 - d) **Program manager.**
- 46) A project manager needs to communicate the needs of his or her personnel requirements and the utilization of each person as well as the assignments that they have in the future. To best accomplish this, what type of document should be used?
- a) Gantt chart
 - b) Network diagram
 - c) **Resource Plan**
 - d) Responsibility matrix
- 47) A project manager is faced with making a decision about a risk that the team has identified. The risk involves the design of a bicycle. It has been found that the neck of the bicycle, where the steering bearing is located and the two supporting bars of the frame come together, will corrode in a high salt environment. If this takes place the neck may fail and injure the rider. The project team decides that the design of the bicycle should be modified by using corrosion resistant materials in the design of the neck. This will eliminate the risk from consideration. This technique is called:
- a) **Risk avoidance.**
 - b) Risk acceptance.
 - c) Risk rejection.
 - d) Risk deflection.

- 48) The type of power anyone can earn regardless of their position is:
- a) Referent
 - b) Expert**
 - c) Penalty
 - d) Formal
- 49) The contingency budget will:
- a) Reduce the probability of scope changes.
 - b) Reduce the probability of cost overruns.**
 - c) Increase the probability of a cost overrun.
 - d) Increase the probability of scope changes.
- 50) A project manager is quantifying risk for her project. Several of her experts are offsite, but wish to be included. How can this be done?
- a) Use Monte Carlo analysis using the Internet as a tool.
 - b) Apply the critical path method.
 - c) Determine options for recommended corrective action.
 - d) Apply the Delphi Technique.**
- 51) Managing stakeholder engagement:
- a) is a planning activity
 - b) uses risk management plan as an input
 - c) occurs at the end of the project
 - d) occurs throughout the project life cycle**
- 52) The customer calls you to ask about the status of the project, and you have an answer prepared as you are speaking with them. This is an example of:
- a) Meeting customer expectations.
 - b) A project manager is always proactive**
 - c) Always keeping a stakeholder with high interest and high influence satisfied.
 - d) Acquiring validation.
- 53) A project manager holds the first risk meeting of the project team. The client is present at the meeting. At the meeting several risks are identified and assigned to members of the project team for evaluation and quantification. The result of the meeting is:
- a) Expected value of the risk events.
 - b) Strategies for the risk events.
 - c) A list of potential risk events.**
 - d) General statements about risks for the project.
- 54) A project manager is using weighted average duration estimates to perform schedule network analysis. Which type of mathematical analysis is being used?
- a) Critical path method
 - b) Three-Point Estimate**
 - c) Monte Carlo
 - d) Resource leveling

- 55) An activity has an early start (ES) of day 3, a late start (LS) of day 13, an early finish (EF) of day 20, and a late finish (LF) of day 30. The activity:
- a) is on the critical path.
 - b) has a lag.
 - c) has a lead.
 - d) **is not on the critical path.**
- 56) Conflict resolution techniques that may be used on a project include confronting, smoothing, forcing and:
- a) **withdrawing.**
 - b) directing.
 - c) organizing.
 - d) controlling.
- 57) Which phase of the project is likely to have the greatest amount of its funding spent?
- a) Initiating
 - b) **Executing**
 - c) Planning
 - d) Closeout
- 58) A control chart shows seven data points in a row on one side of the mean. What should be done?
- a) Perform a design of experiments.
 - b) Adjust the chart to reflect the new mean.
 - c) **Find an assignable cause.**
 - d) Nothing. This is the rule of seven and can be ignored.
- 59) The document that is proof of upper management's commitment to the project and gives the authority to manage the project to the project manager is called:
- a) The project plan.
 - b) The project goals and objectives.
 - c) **The project charter.**
 - d) The project definition.
- 60) Which of the following represents the estimated value of the work actually accomplished?
- a) **Earned value (EV)**
 - b) Planned value (PV)
 - c) Actual cost (AC)
 - d) Cost variance (CV)
- 61) A project team has completed, and the customer has accepted, the completed project scope. However, the lessons learned required by the project management office have not been completed. What is the status of the project?
- a) The project is incomplete because the project needs to be re-planned.
 - b) **The project is incomplete until all project and product deliverables are complete and accepted.**
 - c) The project is complete because the customer has accepted the deliverables.
 - d) The project is complete because the project has reached the due date.

- 62) You are the project manager for a project that has high visibility. Your manager wants you to prepare a presentation for him to present at a conference. Most of the material in the presentation will be facts that are the results of your project. Your manager intends to present the material under his own name. Your name will not appear. What should you do?
- Refuse to work on the presentation unless you are listed as a coauthor.
 - Do the work as you were told by your manager.**
 - Present your own presentation.
 - Meet with your manager's manager and discuss the problem.
- 63) A project manager works in a company favoring the weakest authority for the project manager. The type of organization that holds the project manager to be the weakest is:
- Projectized organization.
 - Strong matrix organization.
 - Weak matrix organization.**
 - Balanced matrix.
- 64) You just found out that a major subcontractor for your project consistently provides deliverables late. The subcontractor approaches you and asks you to continue accepting late deliverables in exchange for a decrease in project costs. This offer is an example of:
- confronting.
 - compromise.**
 - smoothing.
 - forcing.

- 65) What is the total float for activity H in for the following schedule diagram?



- 8
 - 32
 - The same as the free float**
 - 33
- 66) What information do you need to make a crashing decision?
- Critical path and cost efficiency**
 - Critical path only
 - Cost variance for crashing
 - Alternatives analysis
- 67) Which of the following contains Change Management Plan?
- Control scope**
 - Communications management plan
 - Configuration management plan
 - Quality management plan

68) These are generally managed by a senior manager or senior management teams.

- a) Project
- b) Portfolio**
- c) Program
- d) Tasks

69) Resource leveling will generally:

- a) Reduce the time needed to do the project.
- b) Increase the total time necessary to do all the tasks.
- c) Reduce the overutilization of resources.**
- d) Reduce resources to the lowest skill that is possible.

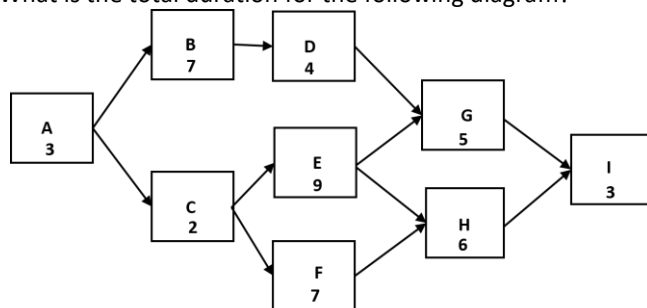
70) Which of the following is considered to be a simulation technique?

- a) PERT analysis
- b) GERT analysis
- c) Monte Carlo analysis**
- d) Critical path method

71) Extensive use of ---- communication is most likely to aid in solving complex problems.

- a) verbal
- b) written**
- c) formal
- d) nonverbal

72) What is the total duration for the following diagram?



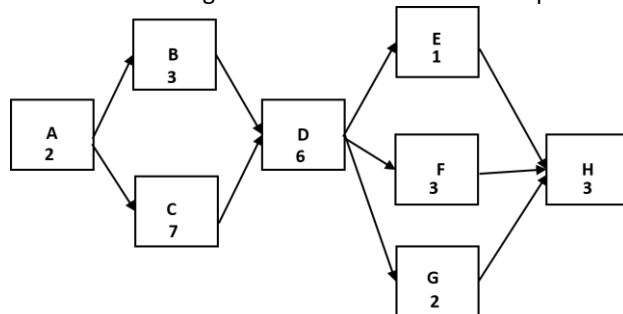
- a) 23**
- b) It cannot be determined
- c) 28
- d) 44

73) When checking the calendar of a team member to schedule a meeting, you see she has scheduled a meeting with a key stakeholder that you were not informed of. The best approach would be to:

- a) avoid mentioning it to the team member but continue to watch her activities.
- b) notify your boss about the problem.
- c) address the concern with the team member's boss.
- d) address the concern with the team member.**

- 74) The key inputs to Define Activities are:
- Work breakdown structure, the project schedule, and the network diagram.
 - Project schedule, progress reports, and change requests.
 - The project network diagram, constraints, and durations.
 - Scope baseline, enterprise environmental factors, and organizational process assets.**
- 75) The customer requests a change to the project that would increase the project risk. Which of the following should you do before all the others?
- Include the expected monetary value of the risk in the new cost estimate.
 - Talk to the customer about the impact of the change.
 - Analyze the impacts of the change with the team.**
 - Change the risk management plan.

- 76) Which activities might be considered near critical path on the following schedule diagram?



- B and C
 - A, D, and H
 - E and G**
 - C and F
- 77) The lowest level at WBS is one of the following:
- The task.
 - The activity.
 - The work package.**
 - The element.
- 78) A project manager would like to manage his project in such a way that he will be able to identify specific tasks that should be watched and managed more closely than others. The project manager should use which method?
- The PERT method
 - The critical path method**
 - The GERT method
 - The PCDM method
- 79) What characteristic best describes the cost baseline?
- Total budget for the project
 - Time phased budget for the project**
 - Total budget for the project including the contingency budget
 - Total budget for the project including the contingency budget and the management reserve

- 80) In attempting to complete the project faster, the project manager looks at the cost associated with crashing each activity. The best approach to crashing would also include looking at the:
- a) **risk impact of crashing each activity.**
 - b) customer's opinion of which activities to crash.
 - c) boss's opinion of which activities to crash and in which order.
 - d) project life cycle phase in which the activity is due to occur.
- 81) A project manager has a problem with a team member's performance. What is best form of communication for addressing this problem?
- a) Formal written communication
 - b) Formal verbal communication
 - c) Informal written communication
 - d) **Informal interactive verbal communication**
- 82) Your employee is three days late with a report. Five minutes before the meeting where the topic of the report is to be discussed, she hands you the report. You notice some serious errors in it. What should you do?
- a) **Cancel the meeting and reschedule when the report is fixed.**
 - b) Go to the meeting and tell the other attendees there are errors in the report.
 - c) Force the employee to do the presentation and remain silent as the other attendees find the errors.
 - d) Cancel the meeting and rewrite the report yourself.
- 83) Which of the following is not a justification for performing quantitative risk analysis?
- a) Complexity
 - b) Massive scale
 - c) Strategic importance
 - d) **The EMV required**
- 84) The act of doing anything that will help to bring future project performance into line with the project plan is called:
- a) Budget update.
 - b) Revised cost estimate.
 - c) **Corrective action.**
 - d) Contingency planning.
- 85) A project is engaged in making electronic devices. It is necessary for them to purchase materials to make the printed circuit boards. All of the parts are common parts that are available from several vendors. The most likely contract that should be issued for these parts is:
- a) Unit price contract.
 - b) **Fixed price contract.**
 - c) Cost reimbursable contract.
 - d) Award fee contract.

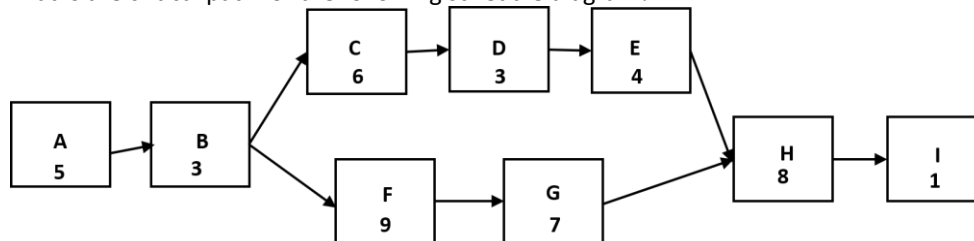
86) You are the project manager for a large project that is completed on time and on budget. The customer and all of the stakeholders are pleased with the results. As a direct result of the successful completion of the project, your manager approves a bonus of \$25,000 to you. There are fifteen members of the project team. One of the people on the project team has been a very low contributor to the project; the other fourteen have all been above standard. What should you do with the money?

- a) Keep the money yourself; you deserve it, and the manager gave it to you.
- b) Divide the money equally among all the team members.
- c) Ask the team members how they would divide the money.**
- d) Divide the money equally among the team members except for the substandard team member.

87) A project manager is using a cause and effect diagram with the team to determine how various factors might be linked to potential problems. In what part of the quality management process is the project manager involved?

- a) Quality analysis
- b) Perform quality assurance
- c) Control quality**
- d) Quality audits

88) What is the critical path for the following schedule diagram?



- a) A-B-C-F-G-H-I
- b) A-B-F-G-H-I**
- c) A-B-C-D-E-H-I
- d) A-B-H-I

89) During which risk management process is a determination to transfer a risk made?

- a) Identify risks
- b) Perform quantitative risk analysis
- c) Plan risk response planning**
- d) Control risks

90) At the request of the project team for a large project, the company's purchasing department advertises that they intend to let a contract for construction work associated with the project. This is called:

- a) Procurement planning.
- b) Solicitation.**
- c) Advertising.
- d) The procurement process.

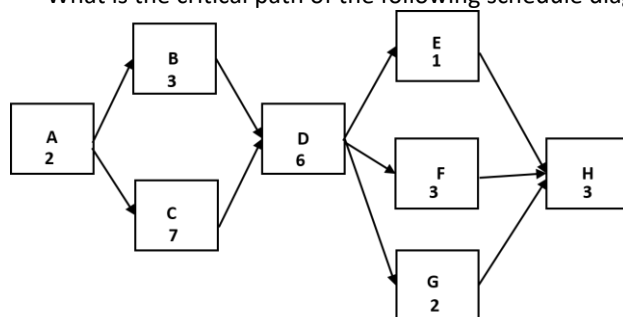
91) A project is considered complete when the :

- a) BAC is equal to the PV.
- b) The EV is equal to the AC.
- c) The PV is equal to the AC.
- d) The BAC is equal to the EV.**

- 92) What does the term “progressive elaboration” refer to?
- a) Constantly changing project scope.
 - b) **Gaining additional clarity and detail of project deliverables as the project moves through the project lifecycle.**
 - c) Letting team members make scope changes without customer approval.
 - d) Is only used where environments are uncertain.
- 93) Communication styles assessment is not new to the work place or projects, although with the expansion of interpersonal styles as a project management skill, related tools have become more prominent. One of the first tools for this purpose was developed by William Moulton in 1928. DISC stands for:
- a) Dominance, Interest, Strength, Commitment
 - b) Definitive, Important, Superior, Cautious
 - c) **Dominance, Influence, Steadiness, Conscientiousness**
 - d) Defiance, Influence, Steadfastness, Caution
- 94) What is the difference between quality and grade?
- a) They are the same.
 - b) **Quality can be precise, while grade means inherent characteristics with the same function.**
 - c) Quality may be perceived while grades are always scored.
 - d) Quality is about attributes and grade is about tolerances.
- 95) The best definition of a risk report is?
- a) To catalog and prioritize risk events
 - b) **To store high level risk information for communication purposes.**
 - c) An output from implement risk response for sharing status of the effort.
 - d) To identify and communicate risk ownership
- 96) Other labels for an Ishikawa diagram include all of the following except:
- a) Fishbone diagram
 - b) Cause and effect diagram
 - c) **Pareto diagram**
 - d) Root cause analysis
- 97) Choose the correct description regarding the technical skills of a project manager.
- a) **Technical skills of a project manager must be sufficiently high to understand technical issues and explain technical decisions to others.**
 - b) Technical skills of a project manager must be equal to or higher than any other team member’s technical skills.
 - c) Technical skills of a project manager should not be considered when selecting a project manager.
 - d) Technical skills of a project manager are the most important criteria for selecting a project manager.
- 98) Managing stakeholder engagement is usually the responsibility of:
- a) The project sponsor
 - b) The performing organization
 - c) The project team
 - d) **The project manager**

- 99) What is the main purpose of the decomposition process?
- Document results of lessons learned.
 - Break down project deliverables into component activities.**
 - Estimate costs and duration for each sub-project.
 - Allocate resources to each activity.
- 100) Which component is a graphical representation of the deliverables included in the project?
- Resource assignment matrix.
 - Work breakdown structure.**
 - Organizational breakdown structure.
 - Project schedule.
- 101) The critical path is established by calculating the following dates:
- Start-to-start, start-to-finish, finish-to-finish, finish-to-start.
 - Early start, early finish, late start, late finish.**
 - Predecessor-to-successor, predecessor-to-predecessor, successor-to-successor.
 - Primary-to-secondary, primary-to-finish, secondary-to-secondary, finish-to-finish.
- 102) What is meant by near-critical activity?
- An activity that is on the critical path.
 - An activity that may have higher risk to the project due to less risk mitigation than activities on the critical path.
 - An activity that is not on the critical path but has low total float.**
 - An activity that has the longest duration.
- 103) Choose the appropriate term that corresponds to “analogous estimating.”
- Bottom-up estimating
 - Simulation
 - Form of expert judgment**
 - Heuristics

- 104) What is the critical path of the following schedule diagram?



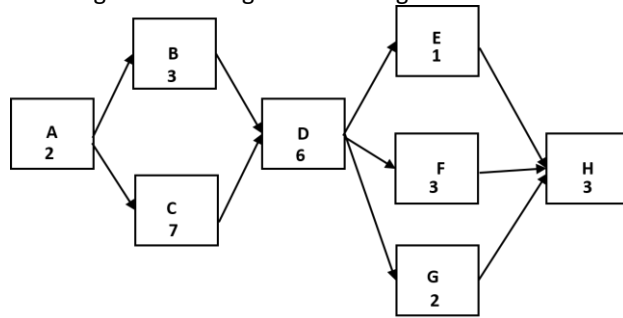
- All activities are on the critical path
- A-B-D-E-H
- A-C-D-F-H**
- A-B-D-G-H

- 105) Benchmarking can help determine:
- a) When to launch a new product.
 - b) Marketing sales costs associated with a specific product.
 - c) **What processes are used by other organizations to achieve customer satisfaction?**
 - d) When to request a quality audit.
- 106) What does this description define: “An interrelationship diagram into which probabilities are placed and a simulation performed”?
- a) A monte Carlo simulation
 - b) **An influence diagram**
 - c) A mind map
 - d) A model
- 107) Which tool is consistently used to document the roles and responsibilities on a project?
- a) Role administration matrix
 - b) **Responsibility assignment matrix**
 - c) Responsibility and role hierarchy
 - d) Staffing management plan
- 108) An alternative to a procurement SOW is an?
- a) RFQ
 - b) SASS
 - c) SLA
 - d) **TOR**
- 109) Who is the quality guru associated with “Plan-Do-Check-Act”?
- a) Taguchi
 - b) **Deming**
 - c) Juran
 - d) Crosby
- 110) In which organizational structure does the project manager have the most authority?
- a) Weak matrix
 - b) Strong matrix
 - c) Functional structure
 - d) **Projectized structure**
- 111) The risk response that can be categorized as either passive or active is:
- a) Risk avoidance.
 - b) Risk mitigation.
 - c) **Risk acceptance.**
 - d) Risk transference.
- 112) What does colocation mean?
- a) That the team members are distributed geographically.
 - b) **That the team is located in one physical location.**
 - c) That the team uses a war room.
 - d) The team member works from home

- 113) Quality audits could take place:
- a) Only at the end of the project
 - b) Only for projectized projects
 - c) **At random intervals over the course of the project.**
 - d) At the beginning of the project
- 114) Stakeholder relationships and interactions might best be represented with a:
- a) **Mind map**
 - b) Flow chart
 - c) RACI diagram
 - d) Organization chart
- 115) The five stages of team development are:
- a) **Forming, storming, norming, performing and adjourning.**
 - b) Initiation, sharing, bonding, coordinating and performing.
 - c) Forming, communicating, structuring, acceptance, and recognition.
 - d) Creation, conflict, communicating, accepting and completion.
- 116) Imperfect knowledge is also referred to as ambiguity risk. Which of the following tools would least likely help to address ambiguity risk?
- a) Expert judgement
 - b) Delphi Technique
 - c) Benchmarking
 - d) **Nominal Group Technique**
- 117) Which are tools and techniques for the conduct procurement process?
- a) Bidder conferences, SWOT analysis, independent estimates, expert judgment.
 - b) Procurement negotiations, advertising, contingent response strategies, proposal evaluation techniques.
 - c) Independent estimates, make-or-buy decisions, qualified seller lists, source selection criteria.
 - d) **Bidder conferences, independent estimates, expert judgment, procurement negotiations.**
- 118) Which statement best describes the project controlling process?
- a) Is used strictly to control scope changes.
 - b) **Is used by the project team throughout the project.**
 - c) Is used only in the control phase of the project.
 - d) Is used to control changes made as a result of project planning and execution.
- 119) What is scope creep?
- a) Reduction of project scope.
 - b) A type of residual risk.
 - c) **Unmanaged changes to the project scope.**
 - d) An activity that needs to be included in the project schedule.

- 120) Which of these is a collection of formal, documented procedures that define the steps by which the project may be changed?
- a) Managing by objective
 - b) Change control system**
 - c) Managing by exception
 - d) Configuration management
- 121) A _____ is an administrative unit that supervises and coordinates the management of all projects in an organization.
- a) CEO
 - b) CIO
 - c) CFO
 - d) PMO**
- 122) Which statement best describes a program?
- a) A strategy for dealing with project risks.
 - b) Two or more phases of a project.
 - c) A collection of related projects managed in a coordinated way.**
 - d) A centralized, permanent, ongoing administrative unit.
- 123) Which of the following is not a leadership characteristic?
- a) Change the status quo
 - b) Ask what and why
 - c) Inspire trust
 - d) Do things right**
- 124) Which of the following is not a common project output?
- a) Lessons Learned
 - b) Retrospectives
 - c) Enterprise Environmental Factors**
 - d) Lesson Learned Register
- 125) Your project is in the process of being formally authorized. What is the name of the document indicating that you have been assigned as the project manager?
- a) Project management plan
 - b) Project charter**
 - c) Project scope statement
 - d) Work breakdown structure

126) Using the following schedule diagram what is the duration of activity H?



- a) 21
- b) 0
- c) **3**
- d) Calculated by LF-LS

127) What is the purpose of the scope management plan?

- a) To list all of the tasks that will be included in the project.
- b) To prevent scope creep by ensuring that all changes to a project plan be reviewed by a review board.
- c) **To identify how the project's scope will be defined, verified, and controlled when changes are proposed.**
- d) To archive all of the information in WBS, RBS, and PBS.

128) Which process involves defining and documenting the stakeholders' needs and expectations to meet the project objectives?

- a) The define scope process.
- b) The develop project management plan process.
- c) **The collect requirements process.**
- d) The create WBS process.

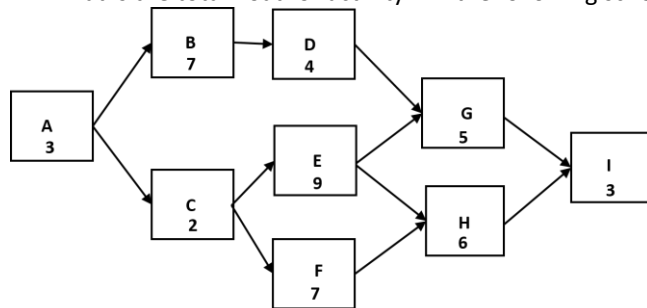
129) A customer knows more about what they do not want than what they do want. Which of the following approaches would least assist with your project effort?

- a) A mockup
- b) A small scale product
- c) **Nominal Group Technique**
- d) Simulation

130) Parametric estimates are most likely to be accurate when all of the following statements are true *except*:

- a) The historical information is accurate.
- b) **The project manager creates the model without input from other stakeholders.**
- c) The parameters used in the model are readily quantifiable.
- d) The model is scalable.

131) What is the total float for activity F in the following schedule diagram?



- a) 7
- b) 14
- c) 2
- d) 0

132) What does collocation mean?

- a) That the team members are distributed geographically.
- b) **That the team is located in one physical location.**
- c) That the team uses a war room.
- d) The team member works from home.

133) Training is an activity which:

- a) Is best done in 3-day increments.
- b) **Provides team members a means to acquire new or enhanced skills.**
- c) Is also known as team building.
- d) Reduces team conflict.

134) When is BAC equal to EAC?

- a) When the project meets objectives.
- b) **When the cost and schedule exactly match the plan.**
- c) When the PV is met.
- d) When the EV is met.

135) Team-building can be beneficial to improving team performance. Of the team development stages, which stage is team-building considered to be the most helpful?

- a) Performing
- b) **Storming**
- c) Norming
- d) Adjourning

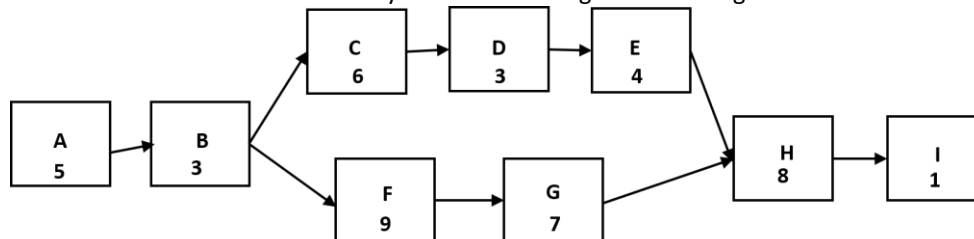
136) The 100% rule requires that ...

- a) 100% of the work must be completed before it can be recognized.
- b) The WBS must be fully decomposed before work may begin.
- c) **All objectives must have at least one work package, and all work package must reflect the value of at least one objective.**
- d) All stakeholders must fully commit to their accountability for the project to be successful.

- 137) In order to track deliverable components that may not have schedule elements, a project manager might apply a _____.
- Work package.
 - Control account.
 - Planning package.**
 - Milestone chart.

- 138) Which of the following resource control methods will likely extend the Total Duration of the project?
- Leads
 - Leveling**
 - Smoothing
 - Lags

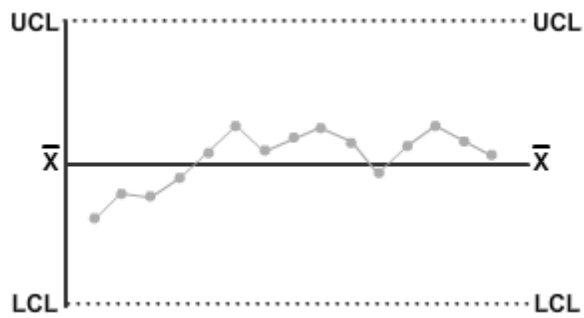
- 139) What is the free float for activity E in the following schedule diagram?



- 0
 - 4
 - 3**
 - 21
- 140) What are the two schedule compression techniques—fast tracking and crashing—used for?
- Planning activity sequence.
 - Shortening total project schedule duration.**
 - Developing an activity schedule.
 - Estimating activity duration.
- 141) Why should you always fast track before crashing?
- Because it always goes faster.
 - Because there is no risk.
 - Because you are not expending additional resources.**
 - Because it is always the easier solution to determine.
- 142) When looking at a crash plot, which activity would you elect to crash first?
- The first activity listed on the left.
 - The activity with the greatest slope.
 - The activity with the least total cost.
 - The activity listed farthest to the right.**

- 143) Your project has a total budget of \$600,000. You have completed 75% of the work. Your bookkeeper suggests that you have spent \$400,000. What is your TCPI?
- a) **.75**
 - b) .25
 - c) \$450,000
 - d) \$200,000
- 144) Which are the reasons that make variance to be sporadic, unusual, and difficult to predict?
- a) **Random causes**
 - b) Common causes
 - c) Special causes
 - d) External causes
- 145) As a member of the Quality Control department it is your responsibility to teach entry-level courses to all technical personnel. In this course, one of the ideas that must be addressed is tolerances versus control limits. Which statement below is *true*?
- a) Tolerances should be tighter than control limits
 - b) **A data point may be outside of the control limits, but still inside of the tolerances**
 - c) Your customer usually sets the control limits
 - d) Your process or equipment usually sets the tolerances
- 146) "500 rejected parts" is an example of which sampling technique?
- a) **Attribute sampling**
 - b) Variable sampling
 - c) Random sampling
 - d) Stratified sampling
- 147) Which chart is ordered by frequency of categorized causes of poor quality performance?
- a) A control chart
 - b) A fishbone diagram
 - c) **A Pareto diagram**
 - d) A trend analysis

148) The graphic is an example of which diagram/chart?



- a) **A control chart**
- b) A fishbone diagram
- c) A Pareto diagram
- d) A cause-and-effect diagram

149) Which of the following is least likely a form of Quality planning based data representation?

- a) A flowchart
- b) A state diagram
- c) A matrix diagram
- d) **An affinity diagram**

150) All of the following are matrix diagram formats except?

- a) **Decision tree**
- b) L,Y,T,X,C
- c) A spreadsheet
- d) Roof shaped

151) DfX stands for?

- a) **Planning for quality during product design**
- b) Statistical quality analysis formulas
- c) Risk Factors affecting design
- d) Design of Experiments

152) Which of the following is an open question?

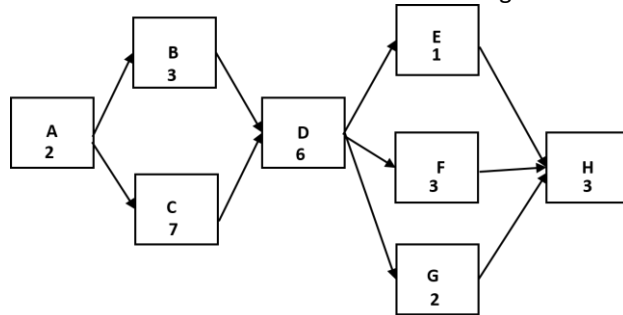
- a) How old are you?
- b) May I open the door for you?
- c) What time is it?
- d) **Where would you like to meet?**

153) Jennifer is a publisher. In order to make sure that she controls project costs, she issues a fixed price contract to her writer. Jennifer is using which risk response?

- a) Risk avoidance.
- b) Risk mitigation.
- c) Risk acceptance.
- d) **Risk transference.**

- 154) The purpose of a risk response audit is:
- a) To examine the ability of the team to meet its quality objectives.
 - b) **To examine the effectiveness of the team's risk response plans.**
 - c) To determine if the team is on budget and on schedule.
 - d) To revise the risk register.
- 155) Another term for Modeling is ...
- a) Prototyping
 - b) **What if analysis**
 - c) Diagramming
 - d) Simulation
- 156) Your risk response plan is not prepared to handle an event that suddenly looks like the impact will exceed contingency. Your first effort should be to?
- a) Fallback
 - b) Actively accept
 - c) **Escalate**
 - d) Mitigate
- 157) One form of Risk Identification is eliciting information from key stakeholders using prompt lists. All of the following are common project management prompt lists except?
- a) PESTLE
 - b) TECOP
 - c) **SCADA**
 - d) VUCA
- 158) The final L and E in PESTLE stand for?
- a) Economic, Lateral
 - b) **Environmental, Legal**
 - c) Education, Legal
 - d) Escalation, Legal
- 159) Which document sent to prospective sellers provides information regarding the requirement specifications and needs of your project?
- a) Procurement management plan
 - b) Project documents
 - c) Procurement document
 - d) **Request for information**

160) What is the total duration for the following schedule diagram?



- a) **21**
- b) 3
- c) 27
- d) 24

161) Some specific types of procurement administration issues are:

- a) Team motivation and conflict.
- b) Ways to develop the project team.
- c) **Legal issues, warranties and waivers.**
- d) Understanding and managing environmental factors.

162) Which statement is true of the contract change control system?

- a) Belongs to the seller rather than the project organization.
- b) **Contains all of the forms, performance tracking, and procedural information needed to deal with contract changes.**
- c) Does not feed information into the project's change control system.
- d) Does not include procedures for reviewing and resolving contract disputes.

163) At some point in the project, a risk may be beyond the scope of the risk owner to react. The best form of risk response in this situation would be?

- a) Passive acceptance
- b) **Escalation**
- c) Mitigation
- d) Enhancement

164) Contract performance milestones can be:

- a) Delivery trends.
- b) **Completion of selected portions of the project work.**
- c) Budget variance.
- d) Risk analysis results.

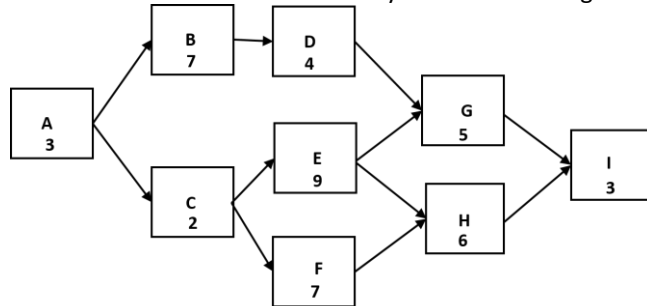
165) Which process is concerned with managing supplier relationships?

- a) **Administer procurements**
- b) Solicitation management
- c) Supplier selection
- d) Procurement planning

- 166) Termination of a contract may occur for all of the following reason *except*:
- a) Completion
 - b) Cause
 - c) Mutual agreement**
 - d) Convenience
- 167) When can a contract close-out occur:
- a) At the end of a project only.
 - b) Whenever a contract is completed and accepted.**
 - c) At the end of a project only, unless the project is terminated early.
 - d) Whenever the supplier submits an invoice.
- 168) You use earned value management to check your Agile project. Your SPI is .65 and your CV is 1.2. What is the status of the project?
- a) You are ahead of schedule and over budget.
 - b) You are ahead of schedule and under budget
 - c) You are over budget and behind schedule.
 - d) You are behind schedule and under budget.**
- 169) The purpose of a procurement audit is:
- a) to provide a formal evaluation of the procurement process and seller's performance**
 - b) to identify weaknesses in the seller's work processes
 - c) to document the effectiveness of risk responses in dealing with identified risks and their root causes as well as the effectiveness of risk management processes
 - d) to review processes from plan procurement process through the administer procurement process
- 170) All of the following are Procurement Delivery Types except...
- a) DB
 - b) DBB
 - c) DBA**
 - d) BOOT
- 171) When negotiating procurements, you may sometime allow the seller to hire additional services or providers in order to complete their contract to you. What do you call this form of procurement?
- a) Services provider acts as representative
 - b) Seller joint venture
 - c) Services provider with subcontracting allowed**
 - d) Services with no subcontracting
- 172) As you review potential sellers, the business analyst on your team performs financial analysis of the alternatives and reports using NPV. Which of the following bids should you best consider?
- a) A product who current value is \$60,000.**
 - b) A product whose value will be \$60,000 when the work is completed.
 - c) A product whose current value is \$45,000 but whose eventual value will be \$61,000.
 - d) A product whose cost will be \$75,000 over the next three years.

- 173) You need to order 2,000 ping pong balls for a recreation of the Captain Kangaroo show. If the show is a success, you need to be able to assure that the seller will remain in business throughout the show's run. Which type of procurement bid document would you use?
- a) **RFQ**
 - b) IFB
 - c) RFI
 - d) RFP
- 174) Who is responsible for ensuring that changes are processed through the integrated change control process?
- a) Project sponsor
 - b) President
 - c) **Project manager**
 - d) Functional manager
- 175) What is true of lessons learned during the project?
- a) Should be documented only in the closeout report.
 - b) Should consist of only project data.
 - c) **Should be documented throughout the project.**
 - d) Should consist of only things that went well during project execution.
- 176) The total budget for your project is \$300,000. The actual cost when you inherit the project as manager is \$160,000. Your evaluation with the team suggests that you will need to spend \$200,000 to complete all of the project effort. What is EAC and what is VAC?
- a) \$200,000 and \$100,000
 - b) **\$360,000 and \$60,000**
 - c) \$300,000 and \$40,000
 - d) \$300,000 and \$200,000
- 177) Validate Scope is a process that ...
- a) Confirms conformance to plan.
 - b) **Acquires formal acceptance from the customer.**
 - c) Applies results from a Quality Audit.
 - d) Requires work performance information.
- 178) Project Knowledge Management includes all of the following personal skills except?
- a) Leadership
 - b) Networking
 - c) **Conflict resolution**
 - d) Active Listening
- 179) A synonym for Tacit might include?
- a) Codified
 - b) **Private**
 - c) Factual
 - d) Documented

180) What is the free float for activity B in the following schedule diagram?



- a) 1
- b) 0**
- c) 7
- d) 11

181) When a change control board marks a suggestion as “MIR”, what do they mean?

- a) The change should be sent into space.
- b) Insufficient information to determine how best to proceed.**
- c) The suggestion crashed and burned.
- d) Approved with a “must implement report” required.

182) What is the difference between a regulation and a standard?

- a) Standards must always be met.
- b) Failing to meet a regulation may result in penalties.**
- c) A regulation is a form of standard
- d) Standards are designed for excellence, regulations are goals.

183) The primary tool of a business analyst to confirm product value during a project is?

- a) Inspection
- b) Traceability Matrix**
- c) Elicitation
- d) Analysis

184) Within agile projects, all team members participate in quality control throughout the project. One of the tools they may use for this purpose is?

- a) Retrospectives
- b) Iterations
- c) Control charts
- d) Checksheets**

185) Which of the following emotional intelligence characteristics would be considered outbound?

- a) Self-awareness
- b) Relationship management**
- c) Maturity
- d) Self-management

186) Which of the following is the definition of a team charter?

- a) The project is assigned to a team instead of a project manager.
- b) Assignments provided to the team by the scrummaster and product owner.
- c) Goals set by the team to assist with meeting common objectives.**
- d) The work the team elects to perform per iteration or sprint.

- 187) One of the most important tools when selecting internal or external resources might be?
- a) The RAM
 - b) The Organizational Structure
 - c) **Multi-criteria decision analysis**
 - d) Interviews
- 188) You have been tasked with putting together a multi-national, cross cultural project team. What would be one of your first considerations?
- a) The budget
 - b) Virtual teams
 - c) The communication model
 - d) **Colocation**
- 189) One of the important considerations used when developing teams is a model called:
- a) Hierarchy of Needs
 - b) **Tuckman Ladder**
 - c) Theory X and Y
 - d) Blake-Mouton
- 190) Which of the following is not a PMIS?
- a) A file cabinet
 - b) Microsoft SharePoint
 - c) A notebook
 - d) **Lessons learned register**
- 191) Written communication should always be all of the following except:
- a) Concise
 - b) Clear
 - c) Coherent
 - d) **Collaborative**
- 192) Agile projects raise additional challenges within the area of communications. Which of the following is the least important agile project cycle component?
- a) Colocation
 - b) Frequent checkpoints
 - c) **Validation**
 - d) Transparent artifacts
- 193) Not all risks are related to 'events'. Other categories of risks might be related to uncertainty or variability. One tools used to help resolve related risks might be:
- a) **Monte-Carlo analysis**
 - b) Alternatives analysis
 - c) Performance reviews
 - d) Trend analysis
- 194) During which risk process group are risk owners confirmed?
- a) Risk identification
 - b) Quantitative risk analysis
 - c) **Qualitative risk analysis**
 - d) Identify Resources

195) Some of the largest drivers pulling contract management away from project management include all of the following except:

- a) Governance
- b) Mega projects
- c) Flow of materials and handoffs
- d) **Regulations**

196) Agile considerations for stakeholder engagement include all of the following except:

- a) Dynamic co-creation
- b) Aggressive Transparency
- c) Public meetings and posting
- d) **Focal point of contact**

197) Given the following crash table, which activity would you crash first?

	Crash week	Crash cost (\$K)	Crash/week
A	4	15	3.75
B	2	22	11
K	1	9	9
N	3	12	4
W	4	18	4.5

- a) **A**
- b) B
- c) K
- d) N

198) The team has worked long hours the last several weeks to meet the customer's desired deadline. Ninety percent of the work is complete, and 86% of the project's \$200,000 budget has been spent. What is the TCPI?

- a) **.71**
- b) 1.11
- c) 1.04
- d) \$20,000

199) All of the following are specific Agile terms except:

- a) Backlog
- b) Retrospective
- c) Kanban
- d) **Iteration**

200) You are in a meeting the project sponsor, the customer, and a few core team members when the customer identifies that the product you plan to deliver will not meet their needs. A team member identifies the problem as a requirement missed during initial planning. The sponsor identifies that all contract elements have been completed. The customer does not want to pay for the product. With whom do you side in this discussion?

- a) The sponsor.
- b) The key team member.
- c) **The customer.**
- d) You set a new direction entirely.

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<http://marketplace.pmi.org>

A direct link to the PMI bookstore and resource marketplace.

ProjectManagement.com

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PMI® acquired ProjectProjectManagement.com and continues to expand services through the site.

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