KEY TERMS

Match each of the key terms above with the definition that best fits it.

____ The complex organizational process whereby computer-based information systems are developed and maintained.

____ Computer software designed to support organizational functions or processes.

____ The organizational role most responsible for the analysis and design of information systems.

____ The second phase of the SDLC, in which system requirements are studied and structured.

____ The third phase of the SDLC, in which the description of the recommended solution is converted into logical and then physical system specifications.

____ The part of the design phase of the SDLC in which all functional features of the system chosen for development are described independently of any computer platform.

____ The part of the design phase of the SDLC in which the logical specifications of the system from logical design are transformed into technology-specific details from which all programming and system construction can be accomplished.

____ The fourth phase of the SDLC, in which the information system is coded, tested, installed, and supported in the organization.

____ The final phase of the SDLC, in which an information system is systematically repaired and improved.

____ Software tools that provide automated support for some portion of the systems development process.

____ A standard process followed in an organization to conduct all the steps necessary to analyze, design, implement, and maintain information systems.

____ The traditional methodology used to develop, maintain, and replace information systems.

____ The first phase of the SDLC, in which an organization's total information system needs are identified, analyzed, prioritized, and arranged.

____ Systems development methodologies and techniques based on objects rather than data or processes.

____ A structure that encapsulates (or packages) attributes and the methods that operate on those attributes. It is an abstraction of a real-world thing in which data and processes are placed together to model the structure and behavior of the real-world object.

____ The property that occurs when entity types or object classes are arranged in a hierarchy and each entity type or object class assumes the attributes and methods of its ancestors—that is, those higher up in the hierarchy. The property allows new but related classes to be derived from existing classes.

____ A logical grouping of objects that have the same (or similar) attributes and behaviors (methods).

____ An object-oriented systems development methodology. This methodology establishes four phases of development, each of which is organized into a number of separate iterations: inception, elaboration, construction, and transition.

REVIEW QUESTIONS

1.19 What is information systems analysis and design?

1.20 How has systems analysis and design changed over the past four decades?

1.21 List and explain the different phases in the SDLC.

1.22 List and explain some of the problems with the traditional waterfall SDLC.

1.23 What are CASE tools?

1.24 Describe each major component of a comprehensive CASE system. Is any component more important than any other?

1.25 Describe how CASE is used to support each phase of the SDLC.

1.26 Explain what is meant by Agile Methodologies.

1.27 What is eXtreme Programming?

1.28 When would you use Agile Methodologies versus an engineering-based approach to development?

1.29 What is object-oriented analysis and design?

KEY TERMS

2.1 Cloud computing

2.2 Enterprise resource planning (ERP) systems

2.3 Outsourcing

2.4 Request for proposal (RFP)

2.5 Reuse

Match each of the key terms above with the definition that best fits it.

____ The practice of turning over responsibility of some or all of an organization's information systems applications and operations to an outside firm.

____ A system that integrates individual traditional business functions into a series of modules so that a single transaction occurs seamlessly within a single information system, rather than several separate systems.

____ A document that is provided to vendors to ask them to propose hardware and system software that will meet the requirements of your new system.

____ The use of previously written software resources, especially objects and components, in new applications.

____ The provision of computing resources, including applications, over the Internet so customers do not have to invest in the computing infrastructure needed to run and maintain computing resources.

REVIEW QUESTIONS

2.6 Describe and compare the various sources of software.

2.7 How can you decide among various off-the-shelf software options? What criteria should you use?

2.8 What is an RFP, and how do analysts use one to gather information on hardware and system software?

2.9 What methods can a systems analyst employ to verify vendor claims about a software package?

2.10 What are ERP systems? What are the benefits and disadvantages of such systems as a design strategy?

2.11 Explain reuse and its advantages and disadvantages.

2.12 Compare and contrast the four approaches to reuse.

KEY TERMS

3.1 COCOMO
3.2 Critical path
3.3 Critical path scheduling
3.4 Deliverable
3.5 Feasibility study
3.6 Gantt chart
3.7 Network diagram

3.8 PERT (Program Evaluation Review Technique)
3.9 Project
3.10 Project charter
3.11 Project closedown
3.12 Project execution
3.13 Project initiation

3.14 Project management
3.15 Project manager
3.16 Project planning
3.17 Project workbook
3.18 Resources
3.19 Slack time
3.20 Work breakdown structure

Match each of the key terms above with the definition that best fits it.

____ A systems analyst with a diverse set of skills—management, leadership, technical, conflict management, and customer relationship—who is responsible for initiating, planning, executing, and closing down a project.

____ A planned undertaking of related activities to reach an objective that has a beginning and an end.

____ An end product of an SDLC phase.

____ A study that determines if the proposed information system makes sense for the organization from an economic and operational standpoint.

____ A controlled process of initiating, planning, executing, and closing down a project.

____ The first phase of the project management process in which activities are performed to assess the size, scope, and complexity of the project and to establish procedures to support later project activities.

____ An online or hard-copy repository for all project correspondence, inputs, outputs, deliverables, procedures, and standards.

____ The second phase of the project management process that focuses on defining clear, discrete activities and the work needed to complete each activity within a single project.

____ The process of dividing the project into manageable tasks and logically ordering them to ensure a smooth evolution between tasks.

____ A graphical representation of a project that shows each task as a horizontal bar whose length is proportional to its time for completion.

____ A diagram that depicts project tasks and their inter-relationships.

____ The third phase of the project management process in which the plans created in the prior phases are put into action.

____ The final phase of the project management process that focuses on bringing a project to an end.

____ Any person, group of people, piece of equipment, or material used in accomplishing an activity.

____ A scheduling technique whose order and duration of a sequence of task activities directly affect the completion date of a project.

____ The shortest time in which a project can be completed.

____ The amount of time that an activity can be delayed without delaying the entire project.

____ A technique that uses optimistic, pessimistic, and realistic time estimates to calculate the expected completion time for a particular task.

____ An automated software estimation model that uses historical project data and current as well as future project characteristics to estimate project costs.

____ A short document prepared for the customer during project initiation that describes what the project will deliver and outlines, generally at a high level, all work required to complete the project.

REVIEW QUESTIONS

3.21 Contrast the following terms:
   a. Critical path scheduling, Gantt, network diagramming, slack time
   b. Project, project management, project manager
   c. Project initiation, project planning, project execution, project closedown
   d. Project workbook, resources, work breakdown structure

3.22 Discuss the reasons why organizations undertake information systems projects.

3.23 List and describe the common skills and activities of a project manager. Which skill do you think is most important? Why?

3.24 Describe the activities performed by the project manager during project initiation.

3.25 Describe the activities performed by the project manager during project planning.

3.26 Describe the activities performed by the project manager during project execution.

3.27 List various project team communication methods and describe an example of the type of information that might be shared among team members using each method.

3.28 Describe the activities performed by the project manager during project closedown.

3.29 What characteristics must a project have in order for critical path scheduling to be applicable?

3.30 Describe the steps involved in making a Gantt chart.

3.31 Describe the steps involved in making a network diagram.

3.32 In which phase of the SDLC does project planning typically occur? In which phase does project management occur?

3.33 What are some reasons why one activity may have to precede another activity before the second activity can begin? In other words, what causes precedence relationships between project activities?

PROBLEMS AND EXERCISES

3.34 Which of the four phases of the project management process do you feel is most challenging? Why?

3.35 What are some sources of risk in a systems analysis and design project and how does a project manager cope with risk during the stages of project management?

3.36 Search computer magazines or the web for recent reviews of project management software. Which packages seem to be most popular? What are the relative strengths and weaknesses of each software package? What advice would you give to someone intending to buy project management software for his or her PC? Why?

3.37 Suppose that you have been contracted by a jewelry store to manage a project to create a new inventory tracking system. Describe your initial approach to the project. What should your first activity be? What information would you need? To whom might you need to speak?

3.38 Can a project have two critical paths? Why or why not? Give a brief example to illustrate your point.

3.39 Calculate the expected time for the following activities.

Activity	Optimistic Time	Most Likely Time	Pessimistic Time	Expected Time
A	3	7	11	
B	5	9	13	
C	1	2	9	
D	2	3	16	
E	2	4	18	
F	3	4	11	
G	1	4	7	
H	3	4	5	
I	2	4	12	
J	4	7	9	

3.40 A project has been defined to contain the following list of activities along with their required times for completion.

Activity No.	Immediate Activity	Time (weeks)	Predecessors
1	Collect requirements	3	
2	Analyze processes	2	1
3	Analyze data	2	2
4	Design processes	6	2
5	Design data	3	3
6	Design screens	2	3,4
7	Design reports	4	4,5
8	Program	5	6,7
9	Test and document	7	7
10	Install	2	8,9

a. Draw a network diagram for the activities.
b. Calculate the earliest expected completion time.
c. Show the critical path.
d. What would happen if activity 6 were revised to take six weeks instead of two weeks?

3.41 Construct a Gantt chart for the project defined in Problem and Exercise 3-40.

3.42 Look again at the activities outlined in Problem and Exercise 3-40. Assume that your team is in its first week of the project and has discovered that each of the activity duration estimates is wrong. Activity 2 will take only two weeks to complete. Activities 4 and 7 will each take three times longer than anticipated. All other activities will take twice as long to complete as previously estimated. In addition, a new activity, number 11, has been added. It will take one week to complete, and its immediate predecessors are activities 10 and 9. Adjust the network diagram and recalculate the earliest expected completion times.

3.43 Construct a Gantt chart and network diagram for a project you are or will be involved in. Choose a project of sufficient depth from work, home, or school. Identify the activities to be completed, determine the sequence of the activities, and construct a diagram reflecting the starting times, ending times, durations, and precedence (network diagram only) relationships among all activities. For your network diagram, use the procedure in this chapter to determine time estimates for each activity and calculate the expected time for each activity. Now determine the critical path and the early and late starting and finishing times for each activity. Which activities have slack time?

3.44 For the project you described in Problem and Exercise 3-43, assume that the worst has happened. A key team member has dropped out of the project and has been assigned to another project in another part of the country. The remaining team members are having personality clashes. Key deliverables for the project are now due much earlier than expected. In addition, you have just determined that a key phase in the early life of the project will now take much longer than you had originally expected. To make matters worse, your boss absolutely will not accept that this project cannot be completed by this new deadline. What will you do to account for these project changes and problems? Begin by reconstructing your Gantt chart and network diagram and determining a strategy for dealing with the specific changes and problems just described. If new resources are needed to meet the new deadline, outline the rationale that you will use to convince your boss that these additional resources are critical to the success of the project.

3.45 Assume that you have a project with seven activities labeled A–G (below). Derive the earliest completion time (or early finish—EF), latest completion time (or late finish—LF), and slack for each of the following tasks (begin at time = 0). Which tasks are on the critical path? Draw a Gantt chart for these tasks.

Activity	Preceding Event	Expected Duration	EF	LF	Slack	Critical Path?
A	—	5				
B	A	3				
C	A	4				
D	C	6				
E	B, C	4				
F	D	1				
G	D, E, F	5				

3.46 Draw a network diagram for the tasks shown in Problem and Exercise 3-45. Highlight the critical path.

3.47 Assume you have a project with ten activities labeled A–J, as shown. Derive the earliest completion time (or early finish—EF), latest completion time (or late finish—LF), and slack for each of the following tasks (begin at time = 0). Which tasks are on the critical path? Highlight the critical path on your network diagram.

Activity	Preceding Event	Expected Duration	EF	LF	Slack	Critical Path?
A	—	4				
B	A	5				
C	A	6				
D	A	7				
E	A, D	6				
F	C, E	5				
G	D, E	4				
H	E	3				
I	F, G	4				
J	H, I	5				

3.48 Draw a Gantt chart for the tasks shown in Problem and Exercise 3-47.

3.49 Assume you have a project with 10 activities labeled A–J. Derive the earliest completion time (or early finish—EF), latest completion time (or late finish—LF), and slack for each of the following tasks (begin at time = 0). Which tasks are on the critical path? Draw both a Gantt chart and a network diagram for these tasks, and make sure you highlight the critical path on your network diagram.

Activity	Preceding Event	Expected Duration	EF	LF	Slack	Critical Path?
A	—	3				
B	A	1				
C	A	2				
D	B, C	5				
E	C	3				
F	D	2				
G	E, F	3				
H	F, G	5				
I	G, H	5				
J	I	2				

3.50 Make a list of the tasks that you performed when designing your schedule of classes for this term. Develop a table showing each task, its duration, preceding event(s), and expected duration. Develop a network diagram for these tasks. Highlight the critical path on your network diagram.

3.51 Fully decompose a project you've done in another course (e.g., a semester project or term paper). Discuss the level of detail where you stopped decomposing and explain why.

3.52 Create a work breakdown structure based on the decomposition you carried out for Problem and Exercise 3-51.

3.53 Working in a small group, pick a project (it could be anything, such as planning a party, writing a group term paper, developing a database application, etc.) and then write the various tasks that need to be done to accomplish the project on Post-it Notes (one task per Post-it Note). Then use the Post-it Notes to create a work breakdown structure (WBS) for the project. Was it complete? Add missing tasks if necessary. Were some tasks at a lower level in the WBS than others? What was the most difficult part of doing this?