Chapter 1 – Introduction to Systems Analysis and Design

MULTIPLE CHOICE

1. ____ refers to the combination of hardware, software, and services that people use to manage, communicate, and share information.
   a. Information systems
   b. Information technology
   c. Computer systems
   d. Computer technology

   ANS: B PTS: 1 REF: 4

2. ____ software controls the flow of data, provides data security, and manages network operations.
   a. Enterprise
   b. System
   c. Application
   d. Legacy

   ANS: B PTS: 1 REF: 7

3. Examples of company-wide applications, called ____, include order processing systems, payroll systems, and company communications networks.
   a. enterprise applications
   b. network operating systems (NOS)
   c. operating applications
   d. legacy systems

   ANS: A PTS: 1 REF: 8

4. Over 40 years ago, a concept called Moore's Law accurately predicted that computer processing power would double about every ____.
   a. 2 months
   b. 12 months
   c. 24 months
   d. 48 months

   ANS: C PTS: 1 REF: 8

5. When planning an information system, a company must consider how a new system will interface with older systems, which are called ____.
   a. enterprise applications
   b. network operating systems (NOS)
   c. operating applications
   d. legacy systems

   ANS: D PTS: 1 REF: 7

6. For complex operations, analysts apply computer-based modeling tools that use a standard language called ____.
   a. electronic data interchange (EDI)
   b. joint application development (JAD)
   c. business process modeling notation (BPMN)
   d. rapid application development (RAD)

   ANS: C PTS: 1 REF: 14

7. Systems analysts use a ____ to graphically represent company operations and information needs.
   a. JAD
   b. Scrum
   c. RAD
   d. business process model

   ANS: D PTS: 1 REF: 13

8. A business ____ is an overview that describes a company's overall functions, processes, organization, products, services, customers, suppliers, competitors, constraints, and future direction.
   a. matrix
   b. profile
   c. index
   d. glossary

   ANS: B PTS: 1 REF: 13

9. Which of the following is one of the main sectors of e-commerce?
   a. C2C
   b. B2C
   c. C2B
   d. BBC

   ANS: B PTS: 1 REF: 9

10. ____ enabled computer-to-computer transfer of data between companies, usually over private telecommunications networks.
    a. EDI
    b. ACH
    c. TCH
    d. O-O

    ANS: A PTS: 1 REF: 10

11. Transaction processing (TP) systems ____.
    a. provide job-related information to users at all levels of a company
    b. simulate human reasoning by combining a knowledge base and inference rules that determine how the knowledge is applied
    c. process data generated by day-to-day business operations
    d. include e-mail, voice mail, fax, video conferencing, word processing, automated calendars, database management, spreadsheets, and integrated mobile computing systems

    ANS: C PTS: 1 REF: 15

12. Business support systems ____.
    a. provide job-related information support to users at all levels of a company
    b. simulate human reasoning by combining a knowledge base and inference rules that determine how the knowledge is applied
    c. process data generated by day-to-day business operations
    d. include e-mail, voice mail, fax, video conferencing, word processing, automated calendars, database management, spreadsheets, and integrated mobile computing systems

    ANS: A PTS: 1 REF: 16

13. Knowledge management systems use a large database called a(n) ____ that allows users to find information by entering keywords or questions in normal English phrases.
    a. inference engine
    b. knowledge base
    c. knowledge management system
    d. inference manager

    ANS: B PTS: 1 REF: 16

14. User productivity systems ____.
    a. provide job-related information to users at all levels of a company
    b. simulate human reasoning by combining a knowledge base and inference rules that determine how the knowledge is applied
    c. process data generated by day-to-day business operations
    d. include e-mail, voice mail, fax, video and Web conferencing, word processing, automated calendars, database management, spreadsheets, desktop publishing, presentation graphics, company intranets, and integrated mobile computing systems

ANS: D PTS: 1 REF: 17

15. In a typical company organizational model, top managers ____.
    a. develop long-range plans, called strategic plans, which define the company's overall mission and goals
    b. provide direction, necessary resources, and performance feedback to supervisors and team leaders
    c. oversee operation employees and carry out day-to-day functions, coordinating operational tasks and people
    d. include users who rely on TP systems to enter and receive the data they need to perform their jobs

    ANS: A PTS: 1 REF: 18

16. In a typical company organizational model, middle managers ____.
    a. develop long-range plans, called strategic plans, which define the company's overall mission and goals
    b. provide direction, necessary resources, and performance feedback to supervisors and team leaders
    c. oversee operation employees and carry out day-to-day functions, coordinating operational tasks and people
    d. include users who rely on TP systems to enter and receive the data they need to perform their jobs

    ANS: B PTS: 1 REF: 18

17. A ____, or requirements model, describes the information that a system must provide.
    a. process model
    b. data model
    c. business model
    d. network model

    ANS: C PTS: 1 REF: 19

18. A(n) ____ shows the data that flows in and out of system processes.
    a. process model
    b. object model
    c. business model
    d. network model

    ANS: A PTS: 1 REF: 22

19. ____ is a systems development technique that produces a graphical representation of a concept or process that systems developers can analyze, test, and modify.
    a. Prototyping
    b. Rapid application development
    c. Scrum
    d. Modeling

    ANS: D PTS: 1 REF: 19

20. ____ is a systems development technique that tests system concepts and provides an opportunity to examine input, output, and user interfaces before final decisions are made.
    a. Scrum
    b. Prototyping
    c. Modeling
    d. Rapid application development

    ANS: B PTS: 1 REF: 20

21. ____ methods include the latest trends in software development.
    a. Object-oriented analysis
    b. Agile/Adaptive
    c. Structured analysis
    d. Rapid application development

ANS: B PTS: 1 REF: 21

22. The ____ method of developing systems is well-suited to project management tools and techniques.
a. object-oriented analysis
b. adaptive
c. structured analysis
d. rapid application development

ANS: C PTS: 1 REF: 21

23. The ____ method of developing systems produces code that is modular and reusable.
a. object-oriented analysis
b. adaptive
c. structured analysis
d. rapid application development

ANS: A PTS: 1 REF: 21

24. The ____ method of developing systems stresses team interaction and reflects a set of community-based values.
a. object-oriented analysis
b. agile/adaptive
c. structured analysis
d. rapid application development

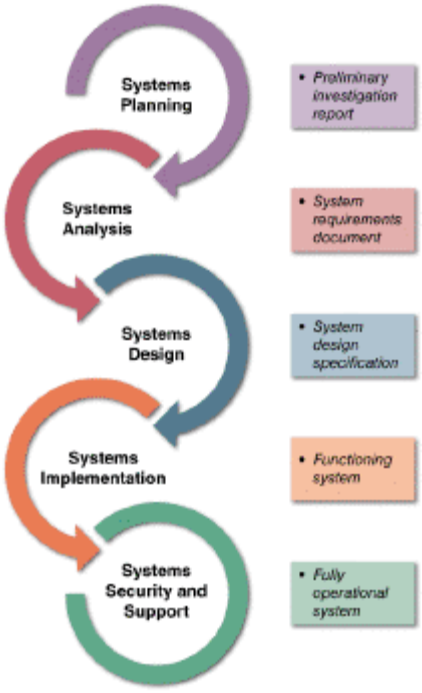
ANS: B PTS: 1 REF: 21

25. Structured analysis is a traditional systems development technique that uses a series of phases, called the ____, to plan, analyze, design, implement, and support an information system.
a. O-O
b. SDLC
c. MSF
d. RUP

ANS: B PTS: 1 REF: 22

26. Because it focuses on processes that transform data into useful information, structured analysis is called a(n) ____ technique.
a. iterative
b. process-centered
c. inferred
d. empowered

ANS: B PTS: 1 REF: 22



27. In the ____, like that shown in the accompanying figure, the result of each phase, which is called a deliverable or end product, flows sequentially into the next phase in the SDLC.
    a. interactive model
    b. requirements model
    c. waterfall model
    d. object model

    ANS: C PTS: 1 REF: 23

28. In the model of the SDLC shown in the accompanying figure, the ____ usually begins with a formal request to the IT department, called a systems request, which describes problems or desired changes in an information system or a business process.
    a. systems design phase
    b. systems planning phase
    c. systems support and security phase
    d. systems analysis phase

    ANS: B PTS: 1 REF: 23

29. In the model of the SDLC shown in the accompanying figure, the purpose of the ____ is to build a logical model of the new system.
    a. systems analysis phase
    b. systems implementation phase
    c. systems design phase
    d. systems support and security phase

    ANS: A PTS: 1 REF: 23

30. In the model of the SDLC shown in the accompanying figure, the purpose of the ____ is to create a physical model that will satisfy all documented requirements for the system.
    a. systems implementation phase
    b. systems planning phase
    c. systems analysis phase
    d. systems design phase

    ANS: D PTS: 1 REF: 24

31. In the model of the SDLC shown in the accompanying figure, during the ____, the new system is constructed.
    a. systems planning phase
    b. systems support and security phase
    c. systems design phase
    d. systems implementation phase

    ANS: D PTS: 1 REF: 24

32. In the model of the SDLC shown in the accompanying figure, during the ____, the IT staff maintains, enhances, and protects the system.
    a. systems support and security phase
    b. systems implementation phase
    c. systems analysis phase
    d. systems planning phase

    ANS: A PTS: 1 REF: 24

33. Whereas structured analysis treats processes and data as separate components, ____ combines data and the processes that act on the data into things called objects.
    a. the MSF
    b. the SDLC
    c. RUP
    d. O-O

    ANS: D PTS: 1 REF: 24

34. In object-oriented analysis, an object is a member of a(n) ____, which is a collection of similar objects.
    a. property
    b. class
    c. message
    d. instance

    ANS: B PTS: 1 REF: 24

35. In object-oriented design, built-in processes called ____ can change an object's properties.
    a. methods
    b. functions
    c. attributes
    d. features

    ANS: A PTS: 1 REF: 25

36. Agile methods typically use a(n) ____model, which represents a series of iterations based on user feedback.
    a. gradual
    b. extreme
    c. spiral
    d. evaluative

    ANS: C PTS: 1 REF: 26

37. The newest development techniques are called ____, which attempt to develop systems incrementally.
    a. structured methods
    b. object-oriented methods
    c. CASE methods
    d. agile/adaptive methods

    ANS: D PTS: 1 REF: 25

38. The ____ group typically provides leadership and overall guidance, but the systems themselves are developed by teams consisting of users, managers, and IT staff members.
    a. Web support
    b. application development
    c. systems support
    d. database administration

    ANS: B PTS: 1 REF: 27

39. ____ provides vital protection and maintenance services for system software and hardware, including enterprise computing systems, networks, transaction processing systems, and corporate IT infrastructure.
    a. User support
    b. Database administration
    c. Systems support and security
    d. Network administration

    ANS: C PTS: 1 REF: 28

40. A(n) ____ investigates, analyzes, designs, develops, installs, evaluates, and maintains a company's information systems.
    a. application developer
    b. database administrator
    c. network administrator
    d. systems analyst

    ANS: D PTS: 1 REF: 29

MULTIPLE RESPONSE

1. An example of a vertical system is a(n) ____.
    a. inventory application
    b. medical practice application
    c. payroll application
    d. database for an auto dealership

    ANS: B, D PTS: 1 REF: 7

2. An example of a horizontal system is a(n) ____.
    a. inventory application
    b. application for a Web-based retailer
    c. payroll application
    d. medical practice application

    ANS: A, C PTS: 1 REF: 7

3. A business process describes a specific set of ____.
   a. transactions
   b. employees
   c. events
   d. results

   ANS: A, C, D PTS: 1 REF: 13

4. Product-oriented firms produced ____.
   a. retail services
   b. routers
   c. computers
   d. microchips

   ANS: B, C, D PTS: 1 REF: 10

5. Database administration involves ____.
   a. network administration
   b. user access
   c. data design
   d. backup

   ANS: B, C, D PTS: 1 REF: 28

MODIFIED TRUE/FALSE

1. System software consists of programs that support day-to-day business functions and provide users with the information they require. _____

   ANS: F, Application

   PTS: 1 REF: 7

2. Value-added services such as consulting, financing, and technical support can be more profitable than hardware. _____

   ANS: T PTS: 1 REF: 10

3. Joint application development (JAD) is like a compressed version of the entire development process. _____

   ANS: F
   Rapid application development
   Rapid application development (RAD)
   RAD
   RAD (Rapid application development)

   PTS: 1 REF: 27

4. Rapid application development focuses on team-based fact-finding. _____

   ANS: F
   Joint application development
   Joint application development (JAD)
   JAD
   JAD (joint application development)

   PTS: 1 REF: 27

5. User support provides users with technical information, training, and productivity support.
   _____

   ANS: T PTS: 1 REF: 28

TRUE/FALSE

1. Most firms give their IT budgets a low priority in bad economic times.

   ANS: F PTS: 1 REF: 4

2. A mission-critical system is one that is unimportant to a company's operations.

   ANS: F PTS: 1 REF: 6

3. In an information system, data is information that has been transformed into output that is valuable to users.

   ANS: F PTS: 1 REF: 6

4. In an information system, information consists of basic facts that are the system's raw material.

   ANS: F PTS: 1 REF: 7

5. The success or failure of an information system usually is unrelated to whether users are satisfied with the system's output and operations.

   ANS: F PTS: 1 REF: 9

6. Although the business-to-business (B2B) sector is more familiar to retail customers, the volume of business-to-consumer (B2C) transactions is many times greater.

   ANS: F PTS: 1 REF: 10

7. TP systems are inefficient because they process a set of transaction-related commands individually rather than as a group.

   ANS: F PTS: 1 REF: 16

8. In a knowledge management system, a knowledge base consists of logical rules that identify data patterns and relationships.

   ANS: F PTS: 1 REF: 16

9. A knowledge management system uses inference rules, which consist of a large database that allows users to find information by entering keywords or questions in normal English phrases.

   ANS: F PTS: 1 REF: 16

10. Most large companies require systems that combine transaction processing, business support, knowledge management, and user productivity features.

    ANS: T PTS: 1 REF: 17

11. Because they focus on a longer time frame, middle managers need less detailed information than top managers, but somewhat more than supervisors who oversee day-to-day operations.

ANS: F PTS: 1 REF: 18-19

12. Many companies find that a trend called empowerment, which gives employees more responsibility and accountability, improves employee motivation and increases customer satisfaction.

ANS: T PTS: 1 REF: 19

13. CASE tools provide an overall framework for systems development and support a wide variety of design methodologies, including structured analysis and object-oriented analysis.

ANS: T PTS: 1 REF: 20

14. It is unusual for system developers to mix and match system development methods to gain a better perspective.

ANS: F PTS: 1 REF: 22

15. In the systems planning phase, a key part of the preliminary investigation is a feasibility study that reviews anticipated costs and benefits and recommends a course of action based on operational, technical, economic, and time factors.

ANS: T PTS: 1 REF: 23

16. In the systems analysis phase, the first step is requirements modeling, where business processes are investigated and what the new system must do to satisfy users is documented.

ANS: T PTS: 1 REF: 23

17. In object-oriented design, objects possess characteristics called properties, which the object inherits from its class or possesses on its own.

ANS: T PTS: 1 REF: 24

18. A scalable design can expand to meet new business requirements and volumes.

ANS: T PTS: 1 REF: 24

19. In object-oriented design, a message requests specific behavior or information from another object.

ANS: T PTS: 1 REF: 25

20. The structure of the IT department varies among companies, as does its name and placement within the organization.

ANS: T PTS: 1 REF: 27

21. An IT group provides technical support, which includes application development, systems support and security, user support, database administration, network administration, and Web support.

ANS: T PTS: 1 REF: 27

22. Network administration includes hardware and software maintenance, support, and security.

    ANS: T PTS: 1 REF: 28

23. Companies typically require that systems analysts have a college degree in information systems, computer science, business, or a closely related field, and some IT experience usually is required.

    ANS: T PTS: 1 REF: 37

24. The responsibilities of a systems analyst at a small firm are exactly the same as those at a large corporation.

    ANS: F PTS: 1 REF: 32

25. A corporate culture is the set of beliefs, rules, traditions, values, and attitudes that define a company and influence its way of doing business.

    ANS: T PTS: 1 REF: 32

COMPLETION

1. _____ refers to the combination of hardware, software, and services that companies use to manage, communicate, and share information.

   ANS:
   Information technology (IT)
   IT

   PTS: 1 REF: 4

2. _____ is a step-by-step process for developing high-quality information systems.

   ANS: Systems analysis and design

   PTS: 1 REF: 5

3. A(n) _____ combines information technology, people, and data to support business requirements.

   ANS: information system

   PTS: 1 REF: 5

4. An IT department team includes _____ who plan, develop, and maintain information systems.

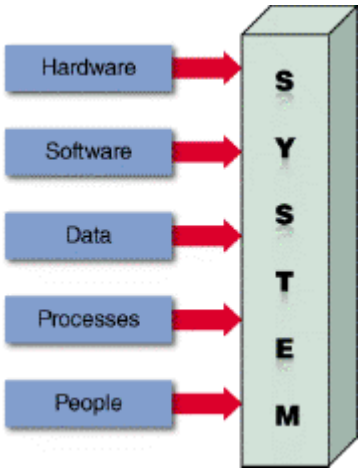
   ANS: systems analysts

   PTS: 1 REF: 5

5. A(n) _____ is a set of related components that produces specific results, such as routing Internet traffic, manufacturing microchips, and controlling complex entities like the Hubbell Telescope.

   ANS: system

   PTS: 1 REF: 6



6. In the accompanying figure showing the components of an information system, _____ consist(s) of everything in the physical layer of the information system.

   ANS: hardware

   PTS: 1 REF: 7

7. In the accompanying figure showing the components of an information system, _____ refer(s) to the programs that control the hardware and produce the desired information or results.

   ANS: software

   PTS: 1 REF: 7

8. In the accompanying figure showing the components of an information system, _____ is/are the raw material that an information system transforms into useful information.

   ANS: data

   PTS: 1 REF: 7

9. In the accompanying figure showing the components of an information system, _____ describe(s) the tasks and business functions that users, managers, and IT staff members perform to achieve specific results.

   ANS: processes

   PTS: 1 REF: 8

10. In the accompanying figure showing the components of an information system, the people, called _____, interact with an information system, both inside and outside the company.

    ANS:
    users
    end users

    PTS: 1 REF: 8

11. The strongest IT companies in the home shopping market are called _____ because their primary business depends on the Internet rather than a traditional business channel.

    ANS: Internet-dependent firms

    PTS: 1 REF: 10

12. Traditional companies sometimes are called _____ companies because they conduct business primarily from physical locations.

    ANS: brick-and-mortar

    PTS: 1 REF: 11

13. Internet-based commerce is called _____ and includes two main sectors: B2C (business-to-consumer) and B2B (business-to-business).

    ANS:
    e-commerce
    electronic commerce
    I-commerce
    Internet commerce

    PTS: 1 REF: 9

14. _____ technology uses high-frequency radio waves to track physical objects.

    ANS:
    RFID
    Radio frequency identification
    RFID (Radio frequency identification)
    Radio frequency identification (RFID)

    PTS: 1 REF: 16

15. A truck fleet dispatcher might run a series of _____ scenarios to determine the impact of increased shipments or bad weather.

    ANS: what-if

    PTS: 1 REF: 16

16. _____ programs run on a company intranet and enable users to share data, collaborate on projects, and work in teams.

    ANS: Groupware

    PTS: 1 REF: 17

17. The systems implementation phase of the SDLC includes an assessment, called a(n) _____, to determine whether the system operates properly and if costs and benefits are within expectation.

    ANS: systems evaluation

    PTS: 1 REF: 24

18. A(n) _____ uses various symbols and shapes to represent data flow, processing, and storage.

    ANS:
    data flow diagram
    DFD
    data flow diagram (DFD)
    DFD (data flow diagram)

    PTS: 1 REF: 23

19. _____ design and construct Web pages, monitor traffic, manage hardware and software, and link Web-based applications to a company's information systems.

    ANS: Web support specialists

    PTS: 1 REF: 29

20. Many hardware and software companies offer _____ for IT professionals, which verifies that an individual demonstrated a certain level of knowledge and skill on a standardized test.

    ANS: certification

    PTS: 1 REF: 31

MATCHING

Identify the letter of the choice that best matches the phrase or definition.

a. MIS
b. modeling
c. message
d. spiral model
e. ERP
f. team leaders
g. operational employees
h. supply chain
i. scalable design
j. prototype

1. In many large companies, these kinds of systems provide cost-effective support for users and managers throughout the company.

2. The name for new business support systems that produced valuable information, in addition to performing manual tasks; their primary users were managers.
3. All companies that provide materials, services, and functions needed to provide a product to a customer.
4. An approach that proponents believe reduces risks and speeds up software development.
5. People who oversee operational employees and carry out day-to-day functions.
6. People who rely on TP systems to enter and receive data they need to perform their jobs.
7. Produces a graphical representation of a concept or process that systems developers can analyze, test, and modify.
8. Requests specific behavior or information from another object.
9. Can expand to meet new business requirements and volumes.
10. An early working version of an information system.

1.	ANS: E	PTS: 1		REF: 15	
2.	ANS: A	PTS: 1		REF: 16	
3.	ANS: H	PTS: 1		REF: 10	
4.	ANS: D	PTS: 1		REF: 26	
5.	ANS: F	PTS: 1		REF: 19	
6.	ANS: G	PTS: 1		REF: 19	
7.	ANS: B	PTS: 1		REF: 19	
8.	ANS: C	PTS: 1		REF: 25	
9.	ANS: I	PTS: 1		REF: 24	
10.	ANS: J	PTS: 1		REF: 20	

ESSAY

1. Explain a knowledge worker, and why this kind of worker is required by successful companies.

   ANS:
   Knowledge workers include systems analysts, programmers, accountants, researchers, trainers, human resource specialists, and other professionals. Knowledge workers also use business support systems, knowledge management systems, and user productivity systems. Knowledge workers provide support for the organization's basic functions. Just as a military unit requires logistical support, a successful company needs knowledge workers to carry out its mission.

   PTS: 1 REF: 19 TOP: Critical Thinking

2. What are the disadvantages of each of the three system development methods?

   ANS:
   With structured analysis, changes can be costly, especially in later phases. Requirements are defined early, and can change during development. Users might not be able to describe their needs until they can see examples of features and functions. With object-oriented analysis, this somewhat newer method might be less familiar to development team members. Interaction of objects and classes can be complex in larger systems. With agile/adaptive methods, team members need a high level of technical and communications skills. Lack of structure and documentation can introduce risk factors. Overall project might be subject to scope change as user requirements change.

   PTS: 1 REF: 21 TOP: Critical Thinking

3. Discuss two advantages and disadvantages of agile methods.

ANS:
Agile methods can allow developers to be much more flexible and responsive, but can be riskier than more traditional methods. Without a detailed set of system requirements, certain features requested by some users might not be consistent with the company's larger game plan.

Iterations produce feedback and enhancements that enable the team to reach the overall project goal. However, a long series of iterations might actually add to project costs and development time.

PTS: 1 REF: 26 TOP: Critical Thinking

CASE

Critical Thinking Questions
Case 1-1

Roark has just joined the company and in his role as lead analyst, he will be responsible for determining which systems development method the team uses to create the new application for a major medical supplier.

1. After Roark has spent a week getting to know the members of the team, including their strengths and weaknesses, and what has worked well (and not so well) for this particular team in the past, one theme keeps recurring: the team has particularly weak communications skills. Which of the following methods, then, is he *least* likely to use, given what he knows about the disadvantages of each method?
   a. structured analysis
   b. agile/adaptive methods
   c. object-oriented analysis
   d. rapid application development

   ANS:
   B

   PTS: 1 REF: 21 TOP: Critical Thinking

2. It is a new day at the firm. Roark has been in place for a few weeks, strengthening the communications skills of his employees, getting them to work much better together. Now, the challenge that he faces is not an internal one; it lies with the client, which is increasingly incapable of sticking with decisions. Roark, based on his past experience with other clients like this, is afraid that the client will throw them a curveball and want to make changes late in the game — but that they also will be unwilling to absorb the costs of those changes. For this reason, Roark eliminates which of the following methods of development?
   a. structured analysis
   b. agile/adaptive methods
   c. object-oriented analysis
   d. rapid application development

   ANS:
   A

   PTS: 1 REF: 21 TOP: Critical Thinking

Critical Thinking Questions
Case 1-2

Maddy has been performing at a very high level at the firm, and so when two colleagues of hers who are currently leading other development efforts get sick or leave the company, she is asked to step in and help manage these two other efforts.

3. When Maddy sits down at the first meeting at which the first group is gathering, she hears them discussing the feasibility study in which they are currently engaged. She knows, then, in which phase of the SDLC this team currently is. Which phase is it?
   a. systems analysis
   b. systems design
   c. systems planning
   d. systems implementation

   ANS:
   C

   PTS: 1 REF: 23 TOP: Critical Thinking

4. After leaving the first meeting, Maddy goes down the hall to meet with the outgoing manager of the second team. In that meeting, he shares with her the latest draft of the systems requirement document, which is nearly complete. In which phase is the second team currently?
   a. systems analysis
   b. systems design
   c. systems planning
   d. systems implementation

   ANS:
   A

   PTS: 1 REF: 24 TOP: Critical Thinking