Chapter 16
Knowledge Application Systems

True-False Questions

1. With knowledge application systems, users utilize another's knowledge without any learning.

   Answer: True Difficulty: Easy Reference: p. 325

2. Since knowledge application system use knowledge, knowledge technologies are applicable while knowledge mechanisms are not.

   Answer: False Difficulty: Easy Reference: p. 325

3. NEC's use of knowledge application system technologies has saved the company over $100 million per year.

   Answer: True Difficulty: Easy Reference: p. 326

4. CBR is the only technology for knowledge application systems.

   Answer: False Difficulty: Easy Reference: p. 327

5. Instance-based reasoning has a focus of automated learning requiring no user involvement.

   Answer: True Difficulty: Easy/Medium Reference: p. 327

6. Analogy-based reasoning is primarily used for classification problems.

   Answer: False Difficulty: Medium Reference: p. 327

7. Application of technologies to knowledge application is dictated by management hierarchy.

   Answer: False Difficulty: Easy Reference: p. 327

8. Rule-based systems are the appropriate technology for domains defined by a manageable set of rules or heuristics.

   Answer: True Difficulty: Easy Reference: p. 328

9. If a domain is represented by imagery, then diagrammatic reasoning is the most suitable technology for a knowledge application system.

   Answer: True Difficulty: Medium Reference: p. 328

10. Adding newly solved cases to the library is the first process step in CBR.

    Answer: False Difficulty: Medium Reference: p. 328-329

11. The Case Method is a methodology to effectively develop CBR and knowledge application systems.

    Answer: True Difficulty: Easy Reference: p. 329

12. The system development process of the Case Method uses software engineering procedures to define, install, and deploy knowledge application systems.

    Answer: False Difficulty: Medium Reference: p. 329

13. The management process of the Case Method describes incentive systems to encourage user acceptance and support of the system.

    Answer: False Difficulty: Medium Reference: p. 329-330

14. Seed cases for a new CBR system may be generated artificially.

    Answer: True Difficulty: Hard Reference: p. 330

15. Using design methods like the Case Method increase systems development time and cost.

    Answer: False Difficulty: Easy Reference: p. 330

16. Knowledge application systems can serve as a framework for creative reasoning.

    Answer: True Difficulty: Medium Reference: p. 330

17. Knowledge application systems facilitate the implementation of decision support systems for design tasks.

    Answer: True Difficulty: Easy Reference: p. 330

18. Knowledge application systems have yet to show any benefit for help desk technologies.

    Answer: False Difficulty: Easy Reference: p. 331

19. With ever increasing technology capabilities, speed of case retrieval is no longer a limitation of CBR-based knowledge application systems.

    Answer: False Difficulty: Medium Reference: p. 347

20. Knowledge application systems may not be able to solve all the problems they come across in complex environments.

    Answer: True Difficulty: Easy Reference: p. 347

Multiple Choice Questions

21. With respect to knowledge application, what are help desks and support centers?
    a. Knowledge technologies supporting routines.
    b. Knowledge technologies supporting direction.
    c. Knowledge mechanisms supporting routines.
    d. Knowledge mechanisms supporting direction.
    e. Help desks and support centers are not related to knowledge application.

    Answer: d Difficulty: Easy/Medium Reference: p. 325

22. With respect to knowledge application, what are policies and standards?
    a. Knowledge technologies supporting routines.
    b. Knowledge technologies supporting direction.
    c. Knowledge mechanisms supporting routines.
    d. Knowledge mechanisms supporting direction.
    e. Policies and standards are not related to knowledge application.

    Answer: a Difficulty: Easy/Medium Reference: p. 325

23. How are expert systems, decision support systems, and fault diagnosis systems related to knowledge application systems?
    a. Mechanisms supporting routines.
    b. Mechanisms supporting direction.
    c. Mechanisms supporting knowledge exchange.
    d. Technologies supporting knowledge exchange.
    e. Technologies supporting direction and routines.

    Answer: e Difficulty: Medium Reference: p. 325

24. What is the SQUAD system in use at NEC?
    a. An expert locator system used to find knowledge resources at NEC.
    b. A group support system-based technology to develop communities of practice at NEC.
    c. A CBR-based technology to support knowledge application in quality control at NEC.
    d. An e-mail technology for facilitating communication among distributed team members.
    e. A quad-tree-based technology for searching CAD drawings of NEC patents.

    Answer: c Difficulty: Medium Reference: p. 326

25. Which of the following is not a technology used to support knowledge application systems?
    a. Rule-based expert systems.
    b. Diagrammatic reasoning systems.
    c. Constraint-based reasoning systems.
    d. CBR systems.
    e. None of the above.

    Answer: e Difficulty: Easy Reference: p. 327

26. Which of the following is the most popular technique for implementing knowledge application systems?
    a. CBR.
    b. Statistical analysis.
    c. Diagrammatic reasoning.
    d. Rule-based.
    e. Nonlinear methods.

    Answer: a Difficulty: Easy Reference: p. 327

27. Which of the following is not a variant of CBR?
    a. Analogy-based reasoning.
    b. Instance-based reasoning.
    c. Constraint-based reasoning.
    d. Exemplar-based reasoning.
    e. None of the above.

    Answer: c Difficulty: Medium/Hard Reference: p. 327

28. What type of technology is recommended when designing a system based on the description of the internal workings of an engineered system?
    a. Rule-based systems.
    b. CBR.
    c. Statistical analysis.
    d. Model-based reasoning.
    e. Diagrammatic reasoning.

    Answer: d Difficulty: Medium Reference: p. 328

29. What type of technology is recommended for domains that have an experience base spanning the entire organization?
    a. Rule-based systems.
    b. CBR.
    c. Statistical analysis.
    d. Model-based reasoning.
    e. Diagrammatic reasoning.

    Answer: b Difficulty: Medium/Easy Reference: p. 328

30. What is the last process in a CBR knowledge application system?
    a. Apply the case generated solution.
    b. Add the new problem solution to the case library.
    c. Obtain feedback on the quality of the solution.
    d. Adapt the solution from the most similar case, if needed.
    e. Index cases to optimize search and retrieval.

    Answer: b Difficulty: Medium Reference: p. 329

31. What type of approach is the Case Method for development of knowledge application systems?
    a. Human computer interaction.
    b. Selective.
    c. Iterative.
    d. Definitive.
    e. Automated data mining.

    Answer: c Difficulty: Medium Reference: p. 329

32. Which of the following is not a process in the Case method cycle?
    a. Systems development.
    b. Business case development.
    c. Systems operation.
    d. Knowledge transfer.
    e. None of the above.

    Answer: b Difficulty: Difficult Reference: p. 329

33. Which process in the Case Method cycle uses statistical analysis to analyze the case library?
    a. Systems development process.
    b. Business case development process.
    c. Case library development process.
    d. Database mining process.
    e. Knowledge transfer process.

    Answer: d Difficulty: Easy Reference: p. 329

34. Which process in the Case Method cycle is concerned with motivating users to accept and use the implemented knowledge application system?
    a. Systems operation process.
    b. Management process.
    c. User satisfaction process.
    d. Knowledge transfer process.
    e. None of the above.

    Answer: d Difficulty: Medium Reference: p. 330

35. Which subprocess of the case library development process allows for the generation of artificial seed cases?
    a. Feedback.
    b. Case generation.
    c. Attribute-value extraction.
    d. Hierarchy formation.
    e. Case collection.

    Answer: e Difficulty: Medium/Hard Reference: p. 330

36. Knowledge application systems not only apply to solving similar problems, but also serve as a framework for _____.
    a. creative reasoning
    b. knowledge sharing
    c. externalization
    d. exchange
    e. application mechanisms

    Answer: a Difficulty: Medium Reference: p. 330

37. What term is used for knowledge application system enabled decision support systems applied to design tasks?
    a. CAD CBR.
    b. Model-based design.
    c. Case-based design aids.
    d. Diagrammatic reasoning systems.
    e. Design support systems.

    Answer: c Difficulty: Medium Reference: p. 331

38. Case libraries can serve to accumulate organizational experiences and as such may be thought of as a _____.
    a. knowledge discovery system
    b. corporate memory
    c. expert advisory system
    d. community of practice
    e. knowledge internalization mechanism

    Answer: b Difficulty: Medium Reference: p. 331

39. What is one are, as exemplified by Compaq's SMART system, where knowledge application systems are specifically important?
    a. Help desk technologies.
    b. Business case development.
    c. Fault diagnosis mechanisms.
    d. Heuristic problem solving methods.
    e. User interface design.

    Answer: a Difficulty: Medium Reference: p. 331

40. Which of the following is not a limitation to the application of CBR-based knowledge application systems?
    a. Security.
    b. Specific.
    c. Scalability.
    d. Speed.
    e. None of the above.

    Answer: e Difficulty: Medium Reference: p. 346-347