Chapter 2
Decision Making, Systems, Modeling, and Support

True-False Questions

1. Fast decision-making requirements may be detrimental to decision quality.

   Answer: True **Difficulty**: Easy **Page Reference**: 48

2. To determine how real decision makers make decisions, we must first understand the process and the important issues of decision making.

   Answer: True **Difficulty**: Moderate **Page Reference**: 48

3. Decision making is a process of choosing among two or more alternative courses of action for the purpose of attaining a goal or goals.

   Answer: True **Difficulty**: Easy **Page Reference**: 48

4. An important characteristic of management support systems is their emphasis on the computational efficiency of obtaining a decision, rather than on the effectiveness of the decision produced.

   Answer: False **Difficulty**: Moderate **Page Reference**: 49

5. For a computerized system to successfully support a manager, it should fit the decision situation and not the decision style.

   Answer: False **Difficulty**: Moderate **Page Reference**: 50

6. A major characteristic of a decision support system is the inclusion of at least one model.

   Answer: True **Difficulty**: Moderate **Page Reference**: 51

7. The collection of data and the estimation of future data are among the most difficult steps in the analysis.

   Answer: True **Difficulty**: Easy **Page Reference**: 56

8. Problem Identification is the conceptualization of a problem in an attempt to place it in a definable category, possibly leading to a standard solution approach.

   Answer: False **Difficulty**: Hard **Page Reference**: 56

9. A problem exists in an organization only if someone or some group takes on the responsibility of attacking it and if the organization has the ability to solve it.

   Answer: True **Difficulty**: Moderate **Page Reference**: 57

10. The process of modeling is pure art and not science.

Answer: False **Difficulty**: Easy **Page Reference**: 58

11. The process of modeling involves determining the (usually mathematical, sometimes symbolic) relationships among the variables.

Answer: True **Difficulty**: Easy **Page Reference**: 58

12. An intermediate variable or a set of intermediate variables describe the environment of the decision making.

Answer: False **Difficulty**: Moderate **Page Reference**: 58

13. "Humans are economic beings whose objective is to maximize the attainment of goals "is one of the assumptions of rational decision makers.

Answer: True **Difficulty**: Easy **Page Reference**: 59

14. The idea of "thinking with your gut" is a heuristic approach to decision making.

Answer: True **Difficulty**: Easy **Page Reference**: 59

15. If a suboptimal decision is made in one part of the organization without considering the details of the rest of the organization, then an optimal solution from the point of view of that part is better for the whole.

Answer: False **Difficulty**: Moderate **Page Reference**: 61

16. Rationality is bounded only by limitations on human processing capacities but not by individual differences.

Answer: False **Difficulty**: Moderate **Page Reference**: 64

17. The choice phase is the one in which the actual decision is made and where the commitment to follow a certain course of action is made.

Answer: True **Difficulty**: Easy **Page Reference**: 68

18. Solving the model is the same as solving the problem the model represents.

Answer: False **Difficulty**: Moderate **Page Reference**: 69

19. The primary requirement of decision support for the intelligence phase is the ability to scan external and internal information sources for opportunities and problems.

Answer: True **Difficulty**: Easy **Page Reference**: 70

20. Alternatives for structured problems can be generated through the use of either standard or special models.

Answer: True **Difficulty**: Easy **Page Reference**: 72

Multiple-Choice Questions

21. Which of the following is the third phase in decision making?

a. Completion
b. Execution
c. Observation
d. Choice

Answer: d **Difficulty**: Moderate **Page Reference**: 49

22. Different decision styles require different types of support. A major factor that determines the type of required support is whether the decision maker is _____.

a. autocratic
b. consultative
c. an individual or a group
d. democratic

Answer: c **Difficulty**: Moderate **Page Reference**: 50

23. Which of the following is a physical replica of a system, usually on a different scale from the original?

a. Complex model
b. Iconic model
c. Duplicated model
d. Composite model

Answer: b **Difficulty**: Moderate **Page Reference**: 51

24. Which of the following model behaves like the real system but does not look like it?

a. Composite model
b. Analog model
c. Dense model
d. Iconic model

Answer: b **Difficulty**: Moderate **Page Reference**: 51

25. There is a continuous flow of activity from one phase to the next phase in a decision making process, but at any phase there may be a return to a previous phase. _____ is an essential part of this process.

a. Testing
b. Trial-and-error
c. Experimenting
d. Modeling

Answer: d **Difficulty**: Moderate **Page Reference**: 53

26. The identification of organizational goals and objectives related to an issue of concern and determination of whether they are being met is the beginning of _____ of decision making.

a. initial phase
b. intelligence phase
c. brainstorming phase
d. generation phase

Answer: b **Difficulty**: Moderate **Page Reference**: 56

27. Which of the following involves finding or developing and analyzing possible courses of action in a decision making phase?

a. Consultation phase
b. Communication phase
c. Intelligence phase
d. Design phase

Answer: d **Difficulty**: Moderate **Page Reference**: 57

28. A(n) _____ is a criterion that describes the acceptability of a solution approach.

a. principle of choice
b. acceptable criterion
c. trade-off
d. worst-case criterion

Answer: a **Difficulty**: Hard **Page Reference**: 58

29. A(n) _____ describes the objective or goal of the decision-making problem.

a. decision variable
b. result variable
c. initial variable
d. intermediate variable

Answer: b **Difficulty**: Moderate **Page Reference**: 58

30. Finding the alternatives with the highest ratio of _____ is one of the ways to achieve optimization.

a. profits to cost
b. margins to cost
c. goal attainment to cost
d. earnings to cost

Answer: c **Difficulty**: Moderate **Page Reference**: 59

31. Which of the following, by definition, requires a decision maker to consider the impact of each alternative course of action on the entire organization because a decision made in one area may have significant effects in other areas?

a. Satisfaction
b. Worst-case
c. Feasibility
d. Optimization

Answer: d **Difficulty**: Easy **Page Reference**: 61

32. A(n) _____ checks the performance of the system for a given set of alternatives, rather than for all alternatives. Therefore, there is no guarantee that an alternative selected with the aid of this analysis is optimal.

a. analytical analysis
b. descriptive analysis
c. optimization analysis
d. quantitative analysis

Answer: b **Difficulty**: Hard **Page Reference**: 62

33. A _____ can help a decision maker sketch out the important qualitative factors and their causal relationships in a messy decision-making situation.

a. mathematical map
b. cognitive map
c. qualitative map
d. narrative map

Answer: b **Difficulty**: Moderate **Page Reference**: 63

34. A _____ describes the decision and uncontrollable variables and parameters for a specific modeling situation.

a. statement
b. model
c. program
d. scenario

Answer: d **Difficulty**: Moderate **Page Reference**: 67

35. Which of the following search approach is <u>not</u> mentioned in searching for an appropriate course of action for solving a decision-making model?

a. Analytical techniques
b. Algorithms
c. Rules of thumb
d. Tabu search

Answer: d **Difficulty**: Moderate **Page Reference**: 69

36. The _____ of a proposed solution to a problem is the initiation of a new order of things or the introduction of change.

a. method
b. implementation
c. approach
d. style

Answer: b **Difficulty**: Moderate **Page Reference**: 69

37. Which of the following is a study of the effect of a change in one or more input variables on a proposed solution?

a. Sensitivity analysis
b. Boundary analysis
c. Fish bone analysis
d. Input-output analysis

Answer: a **Difficulty**: Moderate **Page Reference**: 69

38. One aspect of identifying internal problems is to be able to monitor the current status of operations. When something goes wrong, it can be identified quickly and the problem solved. Which of the following is a tool to provide such capability?

a. Business intelligence
b. Simulation model
c. Product life-cycle management
d. Expert systems

Answer: c **Difficulty**: Moderate **Page Reference**: 71

39. The _____ involves generating alternative courses of action, discussing the criteria for choice and their relative importance, and forecasting the future consequences of using various alternatives.

a. initial phase
b. generation phase
c. brainstorming phase
d. design phase

Answer: d **Difficulty**: Moderate **Page Reference**: 72

40. All phases of the decision making process can be supported by improved communication by _____ through group support systems and knowledge management systems.

a. collaborative computing
b. shared computing
c. collective computing
d. group computing

Answer: a **Difficulty**: Moderate **Page Reference**: 74

Fill In the Blanks

41. Decision making is directly influenced by several major disciplines, some of which are ***behavioral***, (which include anthropology, law, philosophy, political science, psychology, social psychology, and sociology), and some of which are scientific in nature.

Difficulty: Moderate **Page Reference**: 49

42. A ***model*** is a simplified representation or abstraction of reality.

Difficulty: Easy **Page Reference**: 51

43. A major characteristic of a decision support system and many business intelligence tools is the inclusion of at least one ***model***.

Difficulty: Easy **Page Reference**: 51

44. ***Mental models*** are the descriptive representations of decision-making situations that we form in our heads and think about.

Difficulty: Moderate **Page Reference**: 52

45. ***Intelligence*** in decision making involves scanning the environment, either intermittently or continuously.

Difficulty: Moderate **Page Reference**: 55

46. ***Problem classification*** is the conceptualization of a problem in an attempt to place it in a definable category, possibly leading to a standard solution approach.

Difficulty: Hard **Page Reference**: 56

47. Problem classification is the conceptualization of a problem in an attempt to place it in a definable category, possibly leading to a standard solution approach. An important approach classifies problems according to the degree of ***structuredness*** evident in them.

Difficulty: Moderate **Page Reference**: 56

48. A proper balance between the level of ***model simplification*** and the representation of reality must be obtained because of the benefit/cost trade-off.

Difficulty: Hard **Page Reference**: 58

49. The process of modeling is a combination of art and science. As an art, a level of creativity and finesse is required when determining what simplifying ***assumptions*** can work, how to combine appropriate features of the model classes, and how to integrate models to obtain valid solutions.

Difficulty: Moderate **Page Reference**: 58

50. A ***decision variable*** describes the alternatives a manager must choose among, e.g., like how many cars to deliver to a specific rental agency or how to advertise at specific times.

Difficulty: Moderate **Page Reference**: 58

51. A ***normative model*** is a model that prescribes how a system should operate.

Difficulty: Moderate **Page Reference**: 58

52. ***Suboptimization*** may also involve simply bounding the search for an optimum by considering fewer criteria or alternatives or by eliminating large portions of the problem from evaluation.

Difficulty: Hard **Page Reference**: 61

53. ***A descriptive model*** is extremely useful in DSS for investigating the consequences of various alternative courses of action under different configurations of inputs and processes.

Difficulty: Moderate **Page Reference**: 62

54. ***Simulation*** is the imitation of reality and has been applied to many areas of decision making.

Difficulty: Easy **Page Reference**: 62

55. Another descriptive decision-making model is the use of ***narratives*** to describe a decision-making situation. It is extremely effective when a group is making a decision and can lead to a more common frame.

Difficulty: Easy **Page Reference**: 63

56. Aside from estimating the potential utility or value of a particular decision's outcome, the best decision makers are capable of accurately estimating the ***risk*** associated with the resultant outcomes resulting from making each decision.

Difficulty: Easy **Page Reference**: 67

57. A ***what-if analysis*** asks a computer what the effect of changing some of the input data or parameters would be.

Difficulty: Moderate **Page Reference**: 69

58. The model is the critical component in the decision-making process, but one may make a number of errors in its development and use. ***Validating*** the model before it is used is critical.

Difficulty: Easy **Page Reference**: 68

59. A ***solution*** to a model is a specific set of values for the decision variables in a selected alternative.

Difficulty: Moderate **Page Reference**: 69

60. An ***algorithm*** is a step-by-step search in which improvement is made at every step until the best solution is found.

Difficulty: Moderate **Page Reference**: 69

Essay Questions

61. *Compare and contrast decision making by an individual with decision making by a group.*

Obviously when an individual is making a decision, there are no group dynamics. An individual can focus in on a problem, work on it, and come up with a solution. With a group, there can be politicking, groupthink, and other potential dysfunctions. There can also be synergy, because each member of a group brings different facts and abilities to bear.

Difficulty: Easy **Page Reference**: 50

62. Discuss the importance of decision style.

Decision style is the manner in which decision makers think and react to problems. This includes their cognitive response, their values, beliefs, and perceptions. These factors can vary greatly amongst individuals; as a result decisions can vary greatly.

Difficulty: Easy **Page Reference**: 50

63. Describe the different categories of models.

- *Iconic*. An iconic model is a physical replica of a system, usually on a different scale.
- *Analog*. An analog model is more abstract than an iconic model. It is a model that behaves like a system but does not physically look like the system.
- *Mathematical*. The complexity of relationships in many organizational systems cannot be represented by icons or analogically because such representations would soon become cumbersome, and using them would be time-consuming. Therefore, more abstract models are described mathematically.

Difficulty: Moderate **Page Reference**: 51

64. List five benefits of using models.

- Model manipulation is easier than manipulating the real system.
- Models enable compression of time.
- The cost of model analysis is less than the cost of a similar experiment using the real system.
- The cost of making mistakes during the trial-and-error experiment is less using a model.
- Models enable managers to estimate the risk of their actions.
- Mathematical models enable analysis of a large number of possible solutions.
- Models enhance learning and training.
- Models are readily available over the Web.
- There are many Java applets that readily solve models.

Difficulty: Moderate **Page Reference**: 52

65. *Briefly describe Simon's four phases of decision making*.

- *Intelligence phase*. Reality is examined, and the problem is identified and defined.
- *Design phase*. A model that represents the system is constructed by making assumptions that simplify reality. The model is then validated, and criteria are determined for evaluation of the alternative courses of action that are identified.
- *Choice phase*. Select a proposed solution to the problem.
- *Implementation phase*. Successful implementation results in solving the real problem. Failure leads to a return to an earlier phase of the process.

Difficulty: Easy **Page Reference**: 53

66. Briefly describe the steps of intelligence phase of decision making.

- *Problem identification*. The intelligence phase begins with the identification of organizational goals and objectives related to an issue of concern, and determination of whether they are being met.
- *Problem classification*. Problem classification is the conceptualization of a problem in an attempt to place it in a definable category.
- *Problem decomposition*. Many complex problems can be divided into subproblems. Solving the simpler subproblems may help in solving the complex problem.
- *Problem ownership*. A problem exists in an organization only if someone or some group takes on the responsibility of attacking it and if the organization has the ability to solve it.

Difficulty: Moderate **Page Reference**: 55

67. *Briefly describe problem decomposition.*

Many complex problems can be divided into subproblems. Solving the simpler subproblems may help in solving the complex problem. Also, seemingly poorly structured problems sometimes have highly structured subproblems. Just as a semistructured problem results when some phases of decision making are structured while other phases are unstructured, so when some subproblems of a decision making problem are structured with others unstructured, the problem itself is semistructured. Decomposition also facilitates communication among decision makers.

Difficulty: Moderate **Page Reference**: 56

68. Describe the three assumptions of rational decision makers used in Normative decision theory.

- Humans are economic beings whose objective is to maximize the attainment of goals; that is, the decision maker is rational. (More of a good thing [revenue, fun] is better than less; less of a bad thing [cost, pain] is better than more.)
- For a decision-making situation, all viable alternative courses of action and their consequences, or at least the probability and the values of the consequences, are known.
- Decision makers have an order or preference that enables them to rank the desirability of all consequences of the analysis (best to worst).

Difficulty: Moderate **Page Reference**: 59

69. *Compare the normative and descriptive approaches to decision making*.

Normative refers to models that tell you what you should do. These are prescriptive models that usually utilize **optimization**.
Descriptive models are those that tell you "what-if." These are usually **simulation** models.

Difficulty: Easy **Page Reference**: 62

70. *Discuss why scenarios play an important role in management support systems.*

- They help identify opportunities and problem areas.
- They provide flexibility in planning.
- They identify the leading edges of changes that management should monitor.
- They help validate major modeling assumptions.
- They allow the decision maker to explore the behavior of a system through a model.
- They help to check the sensitivity of proposed solutions to changes in the environment as described by the scenario.

Difficulty: Easy **Page Reference**: 68