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| 1. Which of the following is a type of model that is key to virtually every management science application?   |  |  |  | | --- | --- | --- | |  | a. | Heuristic model | |  | b. | Queuing model | |  | c. | Mathematical model | |  | d. | Regression model |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | |

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| 2. Which of the following is *not* one of advantages of mathematical models?   |  |  |  | | --- | --- | --- | |  | a. | Mathematical models enable managers to understand the problem better | |  | b. | Mathematical models allow analysts to employ a variety of mathematical solution procedures | |  | c. | The mathematical modeling process itself, if done correctly, often helps "sell" the solution | |  | d. | Mathematical models help reduce the cost of obtaining a solution |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |

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| 3. Before trusting the answers to what-if scenarios from a spreadsheet model, a manager should attempt to:   |  |  |  | | --- | --- | --- | |  | a. | validate the model | |  | b. | make sure all possible scenarios have been investigated | |  | c. | check the mathematics in the model | |  | d. | sense-check the model |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | |

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| 4. Optimization models are useful for determining:   |  |  |  | | --- | --- | --- | |  | a. | sensitivity to inputs | |  | b. | whether the inputs are valid or not | |  | c. | what the manager should do | |  | d. | the value of the output under the current conditions |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | |

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| 5. Management science has often been taught as a collection of:   |  |  |  | | --- | --- | --- | |  | a. | theories | |  | b. | problems | |  | c. | models | |  | d. | topics |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | |

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| 6. The modeling process discussed in *Practical Management Science* is a   |  |  |  | | --- | --- | --- | |  | a. | seven-step process | |  | b. | six-step process | |  | c. | five-step process | |  | d. | four-step process |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | |

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| 7. Defining an organization's problem includes:   |  |  |  | | --- | --- | --- | |  | a. | specifying the organization's objectives | |  | b. | collecting the organization's historical data | |  | c. | defining the model of the problem | |  | d. | sensitivity analysis |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | |

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| 8. Which of the following type of model is used when an appropriate equation or system of equations can be developed to represent the system?   |  |  |  | | --- | --- | --- | |  | a. | Simulation model | |  | b. | Analytical model | |  | c. | Heuristic model | |  | d. | Spreadsheet model |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | |

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| 9. A first step in determining how well a model fits reality is to:   |  |  |  | | --- | --- | --- | |  | a. | check whether the inputs are correct | |  | b. | see if the sensitivity analysis is correct | |  | c. | check whether the model is valid for the current situation | |  | d. | try some what-if scenarios to see if the model is able to obtain solutions |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | |

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| 10. Which of the following is *not* necessarily a property of a good model?   |  |  |  | | --- | --- | --- | |  | a. | The model represents the client's real problem accurately | |  | b. | The model is as simple as possible | |  | c. | The model is based on a well-known algorithm | |  | d. | The model is one the client can understand |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | |

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| 11. Which of the following is a possible cause if a model's outputs for certain inputs are not as expected?   |  |  |  | | --- | --- | --- | |  | a. | The certain inputs may not be correct | |  | b. | The model could be too detailed of an approximation of the actual situation | |  | c. | The mathematics in the model are inadequate | |  | d. | The analyst's expectations are not correct |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |

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| 12. Which of the following is *not* one of the guiding principles for a heuristic?   |  |  |  | | --- | --- | --- | |  | a. | Common sense | |  | b. | Intuition | |  | c. | Trial and error | |  | d. | Optimality |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | |

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| 13. Which of the following is *not* one of the desired conditions for a successful model implementation?   |  |  |  | | --- | --- | --- | |  | a. | The people who will run the model understand how to enter appropriate inputs | |  | b. | The people who will run the model are able to run what-if analysis | |  | c. | The people who will run the model are able to modify it | |  | d. | The people who will run the model are able to interpret the model's outputs correctly |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | |

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| 14. The most frequent cause of a failed implementation of a model is:   |  |  |  | | --- | --- | --- | |  | a. | the model is incorrect | |  | b. | the analyst fails to communicate how to use the model | |  | c. | the data for the model is unavailable | |  | d. | the model is too complex |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | |

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| 15. Which of the following is *not* one of the reasons for the new-found relevance of management science models?   |  |  |  | | --- | --- | --- | |  | a. | Modeling is an important way to think about problems in general | |  | b. | Modeling is often now a legal requirement | |  | c. | The business world is increasingly driven by numbers | |  | d. | Modeling helps develop intuition for problems |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | |

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| 16. Models that suggest a desirable course of action are called descriptive models   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |

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| 17. In modeling situations where it is not possible to write an equation for an output in terms of the inputs, there may still be a mathematical procedure for calculating outputs from inputs.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *POINTS:* | 1 | |

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| 18. In a descriptive model, the manager first wants to build a model that reflects the current situation.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *POINTS:* | 1 | |

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| 19. One of the advantages of spreadsheet models is that they allow managers to ask what-if questions.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *POINTS:* | 1 | |

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| 20. One of the arguments that management science practitioners have used to criticize the emphasis on specific models is that they do not provide the correct answer.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |

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| 21. The overall modeling process typically done in practice always requires seven steps: define the problem, collect and summarize data, develop a model, verify the model, select one or more suitable decisions, present the results to the organization, and finally implement the model and update it through time.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |

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| 22. Modeling is a process where the essence of a theoretical problem is extracted into a model, spreadsheet or otherwise.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |

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| 23. In some applications, an analyst might present several alternative solutions from a model, and let the organization choose the best one.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *POINTS:* | 1 | |

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| 24. A management science model is typically initiated when an organization believes it has a problem.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *POINTS:* | 1 | |

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| 25. Data are often not in the required form, in which case it is the analysts' job to gather the right data and put it into an appropriate format.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *POINTS:* | 1 | |

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| 26. A good model should achieve the right balance between being too simple and too complex.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *POINTS:* | 1 | |

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| 27. Verification is typically the most difficult phase of the modeling process, from a mathematical perspective.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |

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| 28. As models become larger and more complex, heuristic solutions are often adequate, even though they are not necessarily optimal solutions.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *POINTS:* | 1 | |

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| 29. The best strategy for implementation of a model is to involve key people in the organization in the project when the model is ready for testing and verification.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |

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| 30. A completed model typically marks the end of the modeling process.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | |