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CHAPTER 5

TRANSPORTATION, ASSIGNMENT, AND NETWORK MODELS

SOLUTIONS TO DISCUSSION QUESTIONS

5-1. The transportation model is an example of decision making under certainty since the costs of each shipping route, the demand at each destination, and the supply at each source are all assumed to be known with certainty.

5-2. A balanced transportation problem is one in which total demand (from all destinations) is exactly equal to total supply (from all sources). If a problem is unbalanced, either the demand or the supply constraints must be inequalities.

5-3. The enumeration method is not a practical means of solving 5×5 or 7×7 problems because of the number of possible assignments to be considered. In the 5×5 case, there are $5! = (5 \times 4 \times 3 \times 2 \times 1) = 120$ alternatives that need to be evaluated. In the 7×7 case, there are $7! = 5,040$ alternatives.

5-4. The minimal-spanning model is one that will find the best way to connect all the nodes in a network together while minimizing the total distance between nodes or the total cost of connecting the nodes together. A number of decision modeling problems can be solved using this model: an example was given connecting water and power to a real estate development project. This model can also be used to determine the best way to deliver cable TV to households, connect computers on a computer network, install an oil pipeline, develop a natural gas network, and more.

5-5. The maximal-flow model can be used to determine the maximum number of cars that can flow through a road system, the number of gallons of chemicals that can flow through a chemical processing plant, the

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**Nagraj (Raju) Balakrishnan, Barry
Render, Ralph Stair, Charles Munson**

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the real world usefulness of each technique with many applications from both profit and nonprofit organizations The authors provide an introduction to managerial decision modeling linear programming models modeling applications and sensitivity analysis transportation assignment and network models integer goal and nonlinear programming models project management decision theory queuing models simulation modeling forecasting models and inventory control models The additional material files Chapter 12 Excel files for each chapter Excel modules for Windows Excel modules for Mac 4th edition errata can be found at <https://www.degruyter.com/view/product/486941>

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Table of Contents Managerial Decision Modeling With Spreadsheets Solutions Manual

1. Understanding the eBook Managerial Decision Modeling With Spreadsheets Solutions Manual
 - The Rise of Digital Reading Managerial Decision Modeling With Spreadsheets Solutions Manual
 - Advantages of eBooks Over Traditional Books
2. Identifying Managerial Decision Modeling With Spreadsheets Solutions Manual
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Managerial Decision Modeling With Spreadsheets Solutions Manual
 - User-Friendly Interface

4. Exploring eBook Recommendations from Managerial Decision Modeling With Spreadsheets Solutions Manual
 - Personalized Recommendations
 - Managerial Decision Modeling With Spreadsheets Solutions Manual User Reviews and Ratings
 - Managerial Decision Modeling With Spreadsheets Solutions Manual and Bestseller Lists
5. Accessing Managerial Decision Modeling With Spreadsheets Solutions Manual Free and Paid eBooks
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 - Managerial Decision Modeling With Spreadsheets Solutions Manual Enhanced eBook Features
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 - Adjustable Fonts and Text Sizes of Managerial Decision Modeling With Spreadsheets Solutions Manual
 - Highlighting and Note-Taking Managerial Decision Modeling With Spreadsheets Solutions Manual
 - Interactive Elements Managerial Decision Modeling With Spreadsheets Solutions Manual
8. Staying Engaged with Managerial Decision Modeling With Spreadsheets Solutions Manual
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Managerial Decision Modeling With Spreadsheets Solutions Manual
9. Balancing eBooks and Physical Books Managerial Decision Modeling With Spreadsheets Solutions Manual
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Managerial Decision Modeling With Spreadsheets Solutions Manual
10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Managerial Decision Modeling With Spreadsheets Solutions Manual
 - Setting Reading Goals Managerial Decision Modeling With Spreadsheets Solutions Manual
 - Carving Out Dedicated Reading Time

12. Sourcing Reliable Information of Managerial Decision Modeling With Spreadsheets Solutions Manual
 - Fact-Checking eBook Content of Managerial Decision Modeling With Spreadsheets Solutions Manual
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
14. Embracing eBook Trends
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