Test 30%
Decision Modelling

Answer all questions

1. Which of the following variables is considered to be qualitative?
   A) annual sales
   B) earnings per share
   C) age
   D) method of payment (e.g., cash or credit card)
   E) price

2. Which of the following variables is considered to be quantitative?
   A) soft drink size
   B) make of automobile
   C) army rank
   D) gender
   E) none of the above

3. If all the variables in a model are under the control of the decision maker, then the model is considered to be:
   A) probabilistic
   B) random
   C) mathematical
   D) schematic
   E) deterministic

4. Which of the following models is a picture or drawing of reality?
   A) physical model
   B) schematic model
   C) scale model
   D) mathematical model
   E) analytical model

5. Acquiring input data is part of:
   A) model solution
   B) model formulation
   C) model interpretation
   D) model testing
   E) model identification

6. What is Optimization models and Predictive models?

7. Explained Deterministic models.

8. What is Break-Even analysis?

9. The ABC Corporation is considering introducing a new product, which will require buying new equipment for a monthly payment of $5,000. Each unit produced can be sold for $20.00. ABC incurs a variable cost of $10.00 per unit. How many units must

ABC sell each month to break even?

10. The ABC Corporation is considering introducing a new product, which will require buying new equipment for a monthly payment of $5,000. Each unit produced can be sold for $20.00. ABC incurs a variable cost of $10.00 per unit. What is ABC's monthly break-even amount in dollars?

11. Give some examples of each of the three "occasions for decision"

12. (a) Explain the difference between "optimizing" and "sufficing" in making decisions, and (b) Distinguish between routine and nonroutine decisions.

13. Use a concrete example showing the five-step process by which management science uses a simulation model to solve real-world problems.

14. Consider a factory producing two products, product X and product Y. The problem is this: If you can realize RM10 profit per unit of product X and RM14 per unit of product Y, what is the production level of x units of product X and y units of product Y that maximizes the profit P?

$$\text{maximize } P = 10x + 14y$$

As illustrated in Figure Q11, you can get a profit of

• $350 by selling 35 units of X or 25 units of Y

• $700 by selling 70 units of X or 50 units of Y

• $620 by selling 62 units of X or 44.3 units of Y; or (as in the first two cases as well) any combination of X and Y on the isoprofit line connecting these two points.

Your production, and therefore your profit, is subject to resource limitations, or constraints. Assume in this example that you employ five workers—three machinists and two assemblers—and that each works only 40 hours a week. Products X and/or Y can be produced by these workers subject to the following constraints:

- Product X requires three hours of machining and one hour of assembly per unit.
- Product Y requires two hours of machining and two hours of assembly per unit.

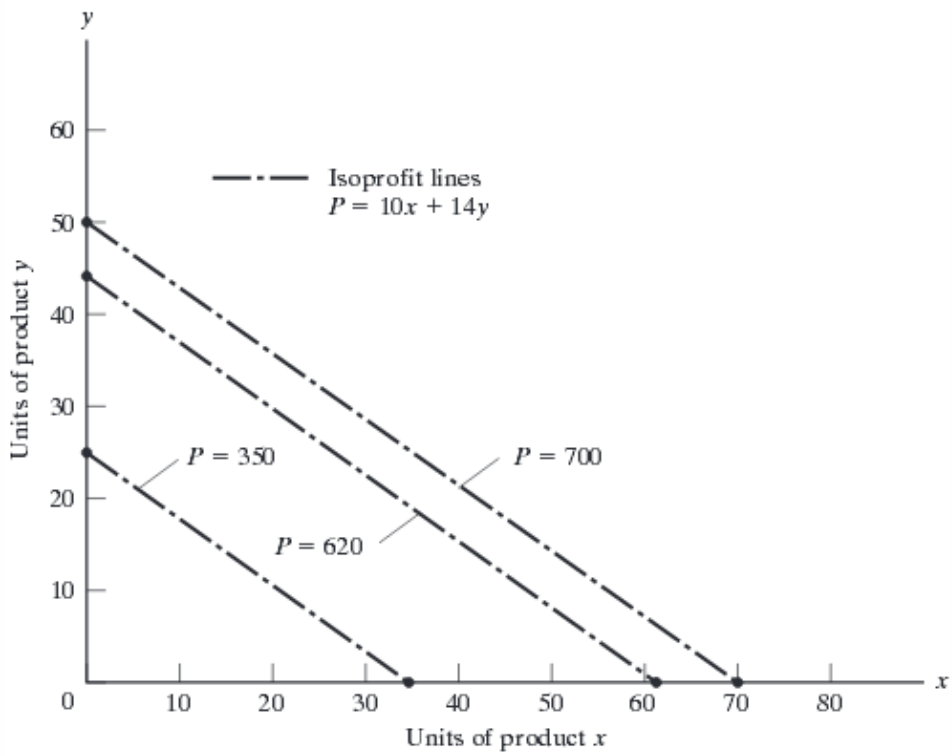
y
60
50
40
30
20
10
0
10
20
30
40
50
60
70
80
x
Units of product y
Units of product x
Isoprofit lines
P = 10x + 14y
P = 350
P = 620
P = 700

Figure Q11