# MBA 602 Practice Final Exam

*The following questions are designed to illustrate the types of questions and material that may be covered on the final exam. Please let me know if you seen any obvious errors or typos on this.*

*You should not consider this practice exam as a definitive guide to the real exam because in a test situation, questions always seem more difficult even though they may have come from the same test bank. Furthermore, the questions below are "fill-in-the-blank" type, but questions on the exam may be multiple choice or essay.*

*Many professors do not give practice exams precisely because some students think the real exam will be essentially the same as the practice exam, then whine when it is not. Therefore, you should not stop your preparations for the exam just because you do well on this practice exercise. The real exam may seem more difficult – the operative concept is "travel at your own risk!"* ☺

1. Which of the following equations has the characteristics that one would expect a linear demand function to have (P = price, Q = quantity sold):
a. P = $-5000 + 10Q
b. P = $5000 + 10Q
c. P = $-5000 - 10Q
d. P = $5000 - 10Q
none of these

2. Each unit of products x and y requires 2.6 pounds and 3.8 pounds, respectively, of a raw material. Assume x equals the number of product x and y equals the number of units of product y. Assuming there is a limit of 500 pounds of the raw material available, which of the following represents an equation that specifies the production of the two products should consume no more than the available supply of the raw material:
a. $2.6x + 9.88xy + 3.8y \leq 500$
b. $2.6x^2 + 3.8y^2 \leq 500$
c. $2.6x + 6.4(x+y) + 3.8y \leq 500$
d. $2.6y + 3.8x \leq 500$
e. none of these

3. A marketing research report suggests that at a price of $40 each, the company can sell 96,000 units of its product per year; at a price of $50, it will sell 64,000 units per year. The function that most closely relates price to quantity sold in the form Q = a+bP would be Q = _____.
a. 200,000 + 13P
b. 224,000 - 3200P
c. 152,000 + 2400P
d. -225,000 - 420P

e. none of these

4. A Solar-Powered Flashlight Company uses the following "management coefficients" equation as a guide for its production planning:

$Q_t = 1000 + .5(S_{t+1}) + .5(S_{t+2}) - 1.1(I_{t-2})$

where $Q_t$ = quantity to produce in period t, $S_{t+1}$ = anticipated sales in the next period, $S_{t+2}$ = anticipated sales in the following period, and $I_{t-2}$ inventory on hand at end of two periods prior. Assume it is now February 1, and the production planning committee must decide how many units to produce in March. How many units would the equation suggest if inventory on hand at the end of the January were 1000 units, and forecast sales for April and May are for 1200 and 1500 units respectively?

a. 1250
b. 1325
c. 1400
d. 1500
e. none of these

5. If the sales forecast for April were increased by 50 units, how much should production change?

a. increase by 5 units b. increase by 25 units c. increase by 50 units
d. decrease by 55 units e. none of these

6. Theoretically, which direction would you generally expect inventory levels to have on the number of units the firm's management would decide to produce?

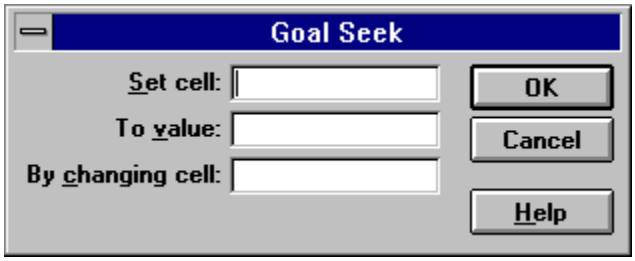
a. positive b. negative c. zero d. none of these

7. Product A has a demand curve P = 1,000 - 5Q, where P = price per unit, Q = quantity sold per week. A marketing company has approached the producer of A with a claim that by running an advertising campaign, the demand curve can be pushed to P = 1,000 - 4Q. Assuming the company is currently selling 100 units per week and can produce no more than 100 units per week regardless of demand, how much would its total revenue (before cost) increase if the ad campaign were successful?

a. $6,000
b. $8,000
c. $10,000
d. $12,543
e. none of these

Tim anticipates that his son, born in 2004, will attend college when he turns 18 in 2022. The son's grandfather will make a first birthday gift of $1,000 for a college fund. Statistics show that annual college costs, $10,000 in 2005, will rise by about eight percent per year. Tim can only get 5 percent at his bank and wonders what rate of interest the $1,000 will have to earn net of taxes to pay for the freshman year entirely in 18 years. He constructed the spreadsheet below and will use Excel's Goal Seek function to determine what the rate of interest ought to be. Answer the questions below based on your examination of the spreadsheet and menu.

| | A | B | C |
|---|---|---|---|
| **1** | Grandchild Education Fund | | |
| **2** | | | |
| **3** | | | College Cost |
| **4** | Year | Gift | Per Year |
| **5** | 2005 | $1,000 | $10,000 |
| **6** | 2006 | $1,050 | $10,800 |
| **etc.** | etc. | etc. | etc. |
| **22** | 2016 | $2,292 | $34,259 |
| **23** | 2017 | $2,407 | $37,000 |
| **24** | | | |
| **25** | Annual After Tax Interest Rate: | | 5% |
| **26** | Annual College Cost Growth: | | 8% |




8. Which of the following is the probable formula used in cell B23:
A. =(1+$C$25)*B22 B. =(1+C25)*B22 C. =(C25)*$B$22 D. =$C$25*B22
E. none of these

9. Which cell would be entered into "Set cell:" within the Goal Seek menu:
A. B23 B. C23 C. C25 D. C26 E. none of these

10. What value would be entered into "To value:" within the Goal Seek menu:
A. .05 B. .08 C. 35964 D. 10000 E. none of these

11. Which cell would be entered into "By changing cell:" within the Goal Seek menu to find the right interest rate?
A. B23 B. C23 C. C25 D. C26 E. none of these

12. How many cells can be changed at once with Goal Seek? _____

13. Name the three sets of parameters that all linear programming formulations typically contain:

14. The purpose of sensitivity analysis in linear programming is to:

15-18: The Countchachange Department Store Corp. is planning to build a store in a new suburban shopping center. The manager assigned to the project wants to develop some rough guidelines for the architect who will attempt to design the building to fit specific needs as much as possible. The guidelines are to include the total number of square feet the store should contain overall, and how many square feet should be custom tailored to the requirements of each of the store's three major departments: Clothing, Jewelry, and Furniture (assume there are no other departments). The architect has indicated that construction of clothing space will cost $100 per square foot, jewelry space $300 per square foot, and furniture space $200 per square foot.

Since clothing will be the new store's merchandising specialty, the manager wants to make certain that the clothing department gets at least twice as much floor space as the other two departments combined. To maintain diversity, however, he wants each of the other departments to get at least 10 percent of the total store floor space. Total construction costs for the new store must be no more than $1 million. Past records indicates that profit contribution per square foot per day are $.80 for clothing departments, $.75 for jewelry departments, and $.60 for furniture departments.

Answer the following questions based on a linear programming formulation to determine how many square feet should be devoted to each department to maximize revenues. (Note: Xc = square feet devoted to clothing, Xj to jewelry, and Xf to furniture.)

15. What approximate form would the objective function take for this problem?
_____

16. How many constraints does this problem have (excluding non-negativity restrictions)? _____

17. Indicate the missing coefficient in the following constraint for this problem (if it is a constraint): ___?___Xc - 2Xj - 2Xf >= 0

18. Indicate the missing coefficient in the following constraint for this problem (if it is a constraint): -.1Xc + ___?___Xj - .1Xf >= 0

19. Customers arriving at a food counter randomly order either meal A, B, or C with probabilities of .50, .30, and .20 respectively. Assuming you are using a table of random integers between 00 and 99, set up a correspondence key by assigning the appropriate random numbers for each meal.

| Type | Prob. |
|---|---|
| A | .50 |
| B | .30 |
| C | .20 |

20. What function could be used on Excel to generate the random numbers, and what function would convert the random numbers into customer type?

21. Using your correspondence key, use the following random numbers to simulate the first five customers: 85, 13, 54, 41, 67 (no warm up period)

| Customer Number | RN | Type |
|---|---|---|
| 1 | 85 | |
| 2 | 13 | |
| 3 | 54 | |
| 4 | 41 | |
| 5 | 67 | |

22. What is the difference between Monte Carlo simulation and "deterministic" simulation?

***Answers: Scroll Down***

*1. d. Any demand function should have a positive intercept and a negative slope because less is demanded the higher the price.*

*2. d.*

*3. b. Solve simultaneous equations 96000 = a + b(40) and 64000 = a + b(50).*
*13.Tthe objective function coefficients, the left hand side constraint coefficients, and the right hand side constraint limits.*

*4. a. $Q_3 = 1000 + .5(1200) + .5(1500) – 1.1(1000) = 1250$*

*5. b.*

*6. Negative. Higher inventory levels would mean there is already plenty of stock so production would likely be cut back.*

*7. c. Currently P = 1000-5(100) = $500 per unit. With new ad, they could charge more: P = 1000-4(100) = $600 each. Current revenue would be $500*100 = $50,000. With new ad, revenue would be $600*100 = $60,000, an increase of $10,000.*

*8. A. 9. A. 10. E ($37,000) 11. C 12. one*

*13. Tthe objective function coefficients, the left hand side constraint coefficients, and the right hand side constraint limits.*
*14. Indicate how sensitive the final solution is to changes in any of the three sets of original parameters, assuming all else equal. Most attention is focused on the right hand side constraint limits because the economic meaning of shadow prices, useful in evaluating the marginal value of adding resources. Second most important is sensitivity to changes in the objective function coefficients. Analysis of changes in the left hand side constraint coefficients is rare, primarily because it represents a fundamental change in the design of the product or the technology used to produce the product, and the "all else equal" assumption.*

*15-18:*

*LP Formulation: Max .8Xc + .75Xj + .6Xf*
*subject to:*
*100Xc + 300Xj +200Xf <= 1,000,000*
*Xc >= 2(Xj +Xf) or Xc - 2Xj - 2Xf >= 0*
*Xj >= .1(Xc + Xj +Xf ) or -.1 Xc + .9Xj - .1Xf >= 0*
*Xf >= .1(Xc + Xj +Xf) or -.1 Xc - .1Xj + .9Xf >= 0*

*Note: The solution: from Solver would be:*
*Sq Ft Each Xc = 6154 Xj =769 Xf =769*

*Total SqFt: 7692*

*Max Rev: $5,962*

*19. Assuming we are using a table of two digit RN: A – 50% - 00-49, B – 30% - 50-79, C – 20% - 80-99.*

*20. =RAND(), vlookup functions*

*21.*

| *Number* | *RN* | *Type* |
|---|---|---|
| *1* | *85* | *C* |
| *2* | *13* | *A* |
| *3* | *54* | *B* |
| *4* | *41* | *A* |
| *5* | *97* | *C* |

*22. Monte Carlo deals with random variables, deterministic simulation does not.*