

Supply Chain Management, 6e (Chopra/Meindl)
Chapter 16 Pricing and Revenue Management in a Supply Chain

16.1 True/False Questions

1) *Revenue management* is the use of marketing to increase the profit generated from a limited supply of supply chain assets.

Answer: FALSE

Diff: 2

Topic: 16.1 The Role of Pricing and Revenue Management in a Supply Chain

AACSB: Application of knowledge

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

2) Pricing may influence demand if customers are price sensitive.

Answer: TRUE

Diff: 2

Topic: 16.1 The Role of Pricing and Revenue Management in a Supply Chain

AACSB: Application of knowledge

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

3) Revenue management may also be defined as the use of differential pricing based on customer segment, time of use, and product or capacity availability to increase supply chain surplus.

Answer: TRUE

Diff: 2

Topic: 16.1 The Role of Pricing and Revenue Management in a Supply Chain

AACSB: Application of knowledge

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

4) Revenue management adjusts the pricing and available supply of assets to maximize profits.

Answer: TRUE

Diff: 1

Topic: 16.1 The Role of Pricing and Revenue Management in a Supply Chain

AACSB: Application of knowledge

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

5) In theory, the concept of differential pricing decreases total cost for a firm.

Answer: FALSE

Diff: 2

Topic: 16.1 The Role of Pricing and Revenue Management in a Supply Chain

AACSB: Application of knowledge

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

6) To differentiate between the various market segments, the firm must either eliminate barriers that identify product or service attributes the segments value differently.

Answer: FALSE

Diff: 1

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Analytical thinking

Objective: LO 16.2: Identify conditions under which revenue management tactics can be effective.

7) In most instances of differential pricing, demand from the segment paying the lower price arises earlier in time than demand from the segment paying the higher price.

Answer: TRUE

Diff: 2

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Analytical thinking

Objective: LO 16.2: Identify conditions under which revenue management tactics can be effective.

8) Spoilage occurs when the capacity reserved for higher price buyers is wasted because demand from the higher price segment does not materialize.

Answer: TRUE

Diff: 1

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

9) Wastage occurs if higher price buyers have to be turned away because the capacity has already been committed to lower price buyers.

Answer: FALSE

Diff: 2

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

10) An order from a lower price buyer should be accepted if the expected revenue from a higher price buyer is lower than the current revenue from the lower price buyer.

Answer: TRUE

Diff: 1

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

11) Unused capacity from the past is extremely valuable.

Answer: FALSE

Diff: 1

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

12) The tactic of varying price over time is suitable for assets such as fashion apparel that have a clear date beyond which they lose a lot of their value.

Answer: TRUE

Diff: 1

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

13) Effective differential pricing over time will generally increase the level of product availability for the consumer willing to pay full price, but will decrease total profits for the retailer.

Answer: FALSE

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

14) The tactic of overbooking or overselling the available asset is suitable in any situation where customers are able to cancel orders and the value of the asset drops significantly after a deadline.

Answer: TRUE

Diff: 1

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

15) The basic trade-off to consider during overbooking is between having wasted capacity (or inventory) because of few cancellations or having a shortage of capacity (or inventory) because of excessive cancellations.

Answer: FALSE

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

16) The cost of wasted capacity is the margin that would have been generated if the capacity had been used for production.

Answer: TRUE

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

17) The cost of a capacity shortage is the increase in productivity that results from having to go to a backup source.

Answer: FALSE

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

18) The goal when making the overbooking decision is to maximize supply chain profits by minimizing the cost of wasted capacity and the cost of capacity shortage.

Answer: TRUE

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

19) The amount of the asset reserved for the higher price segment is such that the expected marginal revenue from the higher priced segment is less than the price to the lower price segment.

Answer: FALSE

Diff: 1

Topic: 16.4 Pricing and Revenue Management for Seasonal Demand

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

20) Faced with seasonal peaks, an effective revenue management tactic is to charge a higher price during the peak period and a higher price during off-peak periods.

Answer: FALSE

Diff: 3

Topic: 16.4 Pricing and Revenue Management for Seasonal Demand

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

21) Shifting demand from peak to off-peak periods is beneficial if the discount given during the off-peak period is more than offset by the decrease in cost because of a smaller peak and the increase in revenue during the off-peak period.

Answer: TRUE

Diff: 1

Topic: 16.4 Pricing and Revenue Management for Seasonal Demand

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

22) The amount reserved for the spot market should be such that the expected marginal revenue from the spot market equals the current revenue from a bulk sale.

Answer: TRUE

Diff: 2

Topic: 16.4 Pricing and Revenue Management for Seasonal Demand

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

23) The reserved quantity will be affected by the difference in margin between the spot market and the bulk sale, but not the distribution of demand from the spot market.

Answer: FALSE

Diff: 2

Topic: 16.4 Pricing and Revenue Management for Seasonal Demand

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

24) Ultimately, a proper understanding of customer preferences and a quantification of the impact of various tactics on consumer behavior are at the core of successful revenue management.

Answer: TRUE

Diff: 2

Topic: 16.4 Pricing and Revenue Management for Seasonal Demand

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

25) Any asset that loses value over time is perishable.

Answer: TRUE

Diff: 3

Topic: 16.5 Pricing and Revenue Management for Bulk and Spot Contracts

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

26) The forecasting function is not necessary for most revenue management systems.

Answer: FALSE

Diff: 2

Topic: 16.6 Using Pricing and Revenue Management in Practice

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

27) The goal of optimization is to use forecasts of customer behavior to identify a revenue management tactic that will be most effective.

Answer: TRUE

Diff: 1

Topic: 16.6 Using Pricing and Revenue Management in Practice

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

28) Too low a level of overbooking will lead to unutilized assets and lost revenue.

Answer: TRUE

Diff: 1

Topic: 16.6 Using Pricing and Revenue Management in Practice

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

29) Salespeople must understand the revenue management tactic in place so they can align their sales pitch accordingly.

Answer: TRUE

Diff: 1

Topic: 16.6 Using Pricing and Revenue Management in Practice

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

30) Customers will have a negative perception of revenue management tactics if they are simply presented as a mechanism for extracting maximum revenue.

Answer: TRUE

Diff: 1

Topic: 16.6 Using Pricing and Revenue Management in Practice

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

16.2 Multiple Choice Questions

- 1) Pricing can be used to
A) change available supply.
B) reduce supply chain costs.
C) influence demand if customers are price sensitive.
D) all of the above

Answer: C

Diff: 2

Topic: 16.1 The Role of Pricing and Revenue Management in a Supply Chain

AACSB: Application of knowledge

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

- 2) Revenue management is
A) the use of marketing tools to increase revenue.
B) the use of pricing to increase the profit generated from a limited supply of supply chain assets.
C) a process designed to determine the best use of funds generated through sales.
D) the use of accounting tools to monitor cash flow.

Answer: B

Diff: 3

Topic: 16.1 The Role of Pricing and Revenue Management in a Supply Chain

AACSB: Application of knowledge

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

- 3) The two forms of supply chain assets are
A) capacity and inventory.
B) capacity and revenue.
C) inventory and revenue.
D) inventory and warehouse space.

Answer: A

Diff: 1

Topic: 16.1 The Role of Pricing and Revenue Management in a Supply Chain

AACSB: Application of knowledge

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

4) Revenue management may be defined as

A) the use of differential costing based on product or capacity availability to decrease supply chain cost.

B) the use of differential costing based on customer segment, time of use, and product or capacity availability to increase profitability.

C) the use of differential pricing based on customer segment, time of use, and product or capacity availability to decrease supply chain surplus.

D) the use of differential pricing based on customer segment, time of use, and product or capacity availability to increase supply chain surplus.

Answer: D

Diff: 2

Topic: 16.1 The Role of Pricing and Revenue Management in a Supply Chain

AACSB: Application of knowledge

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

5) The use of differential pricing should

A) decrease total profits for a firm.

B) increase total profits for a firm.

C) increase capacity for a firm.

D) decrease capacity utilization for a firm.

Answer: B

Diff: 2

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Reflective thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

6) To differentiate between the various market segments, the firm must

A) create barriers by identifying product or service attributes that the segments value differently.

B) eliminate barriers that identify product or service attributes that the segments value differently.

C) negotiate separately with different market segments that value product or service attributes differently.

D) develop pricing structures based on the volume of various product or service attributes.

Answer: A

Diff: 2

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Reflective thinking

Objective: LO 16.2: Identify conditions under which revenue management tactics can be effective.

- 7) In most instances of differential pricing, demand from the segment paying the lower price
A) arises earlier in time than demand from the segment paying the higher price.
B) arises later in time than demand from the segment paying the higher price.
C) arises about the same time as demand from the segment paying the higher price.
D) arises both earlier and later in time than demand from the segment paying the higher price.

Answer: A

Diff: 2

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Reflective thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

- 8) The basic trade-off to be considered by the supplier with production capacity is between
A) committing to an order from a high-price buyer or waiting for a lower price buyer to arrive later on.
B) committing to an order from a lower price buyer or waiting for a high-price buyer to arrive later on.
C) allowing the market to be controlled by price or capacity.
D) having marketing or operations establish the constraints within which orders are accepted.

Answer: B

Diff: 1

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

- 9) When the capacity reserved for higher price buyers is wasted because demand from the higher price segment does not materialize, this is
A) spill.
B) spoilage.
C) wastage.
D) excess.

Answer: B

Diff: 2

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

10) If higher price buyers have to be turned away because the capacity has already been committed to lower price buyers, this is

- A) spill.
- B) spoilage.
- C) wastage.
- D) excess.

Answer: A

Diff: 2

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

11) An order from a lower price buyer

- A) should always be accepted rather than waiting for potential revenue from a higher price buyer.
- B) should only be accepted if the expected revenue from a higher price buyer is higher than the current revenue from the lower price buyer.
- C) should be accepted if the expected revenue from a higher price buyer is lower than the current revenue from the lower price buyer.
- D) should not be accepted if the expected revenue from a higher price buyer is lower than the current revenue from the lower price buyer.

Answer: C

Diff: 1

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Reflective thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

12) The amount of the asset reserved for the higher price segment is such that

- A) all orders from the lower priced segment will be accepted and filled.
- B) the expected marginal revenue from the higher priced segment is more than the price to the lower price segment.
- C) the expected marginal revenue from the higher priced segment is less than the price to the lower price segment.
- D) the expected marginal revenue from the higher priced segment equals the price to the lower price segment.

Answer: D

Diff: 2

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Reflective thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

Scenario 16.1 - The Stone Lion

The Stone Lion, a bed and breakfast located in a sleepy town, caters to two groups of customers, young couples interested in something marginally more exotic than a staycation, and corporate clients interested in doing some team-building at a location with no cellular service. Corporations know they can get rooms with minimal notice, but young couples on tight budgets tend to plan well in advance of their planned stay at the property. The corporate rate for rooms is \$250 per person and the demand pattern is normal with a mean of 20 and a standard deviation of 10. The proprietor of the Stone Lion takes pity on the young couples and charges them only \$150 for identical accommodations.

13) How many rooms should be reserved for corporate clients?

- A) 17
- B) 14
- C) 13
- D) 10

Answer: A

Diff: 2

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

14) If the price young couples are willing to pay increases by 50%, how many rooms should be reserved for corporate clients?

- A) 17
- B) 7
- C) 4
- D) 10

Answer: B

Diff: 2

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

15) If the corporate demand and standard deviation both decrease by 50%, how many rooms should be reserved for corporate clients?

- A) 7
- B) 8
- C) 9
- D) 10

Answer: C

Diff: 2

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

16) What is the difference in the number of rooms that should be held by the Stone Lion if the standard deviation of corporate demand increases by five and if it decreases by five?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: C

Diff: 3

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

17) If the corporate price and young couples' price both double, how many additional rooms should the Stone Lion hold for corporate clients?

- A) 3
- B) 2
- C) 1
- D) 0

Answer: D

Diff: 2

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

- 18) The tactic of varying price over time is suitable for assets
- A) that do not have a clear date beyond which they lose a lot of their value.
 - B) that have a clear date beyond which they lose a lot of their value.
 - C) where customers are able to cancel orders and the value of the asset drops significantly after a deadline.
 - D) where customers are unable to cancel orders and the value of the asset drops significantly after a deadline.

Answer: B

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Reflective thinking

Objective: LO 16.2: Identify conditions under which revenue management tactics can be effective.

- 19) Effective differential pricing over time will generally
- A) decrease the level of product availability for the consumer willing to pay full price and also decrease total profits for the retailer.
 - B) decrease the level of product availability for the consumer willing to pay full price but will increase total profits for the retailer.
 - C) increase the level of product availability for the consumer willing to pay full price and also increase total profits for the retailer.
 - D) increase the level of product availability for the consumer willing to pay full price but will decrease total profits for the retailer.

Answer: C

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Reflective thinking

Objective: LO 16.2: Identify conditions under which revenue management tactics can be effective.

- 20) The tactic of overbooking or overselling the available asset is suitable where
- A) there is a clear date beyond which the asset loses a lot of its value.
 - B) there is no clear date beyond which the asset loses a lot of its value.
 - C) customers are able to cancel orders and the value of the asset drops significantly after a deadline.
 - D) customers are unable to cancel orders and the value of the asset drops significantly after a deadline.

Answer: C

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Reflective thinking

Objective: LO 16.2: Identify conditions under which revenue management tactics can be effective.

- 21) The basic trade-off to consider during overbooking is between
- A) having wasted capacity (or inventory) or a shortage of capacity (or inventory).
 - B) having lost sales or a shortage of capacity (or inventory).
 - C) having wasted capacity (or inventory) or excess capacity (or inventory).
 - D) having high sales or a shortage of capacity (or inventory).

Answer: A

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

- 22) Wasted capacity (or inventory) occurs when
- A) there are excessive cancellations.
 - B) there are few cancellations.
 - C) an expensive backup needs to be arranged.
 - D) all of the above

Answer: A

Diff: 1

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

- 23) A shortage of capacity (or inventory) occurs when
- A) there are excessive cancellations.
 - B) there are few cancellations.
 - C) an expensive backup needs to be arranged.
 - D) B and C only

Answer: B

Diff: 1

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

- 24) The cost of wasted capacity is
- A) the reduction in margin that results from having to go to a backup source.
 - B) the margin that would have been generated if the capacity had been used for production.
 - C) the productivity increase generated when the capacity is used for production.
 - D) the sales potential of excess capacity kept in reserve for emergency production.

Answer: B

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

25) The cost of a capacity shortage is

- A) the reduction in margin that results from having to go to a backup source.
- B) the margin that would have been generated if the capacity had been used for production.
- C) the productivity increase generated when the capacity is used for production.
- D) the sales potential of excess capacity kept in reserve for emergency production.

Answer: A

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

26) The goal when making the overbooking decision is to maximize supply chain profits by

- A) maximizing the value of wasted capacity and the cost of capacity shortage.
- B) maximizing supply chain profits.
- C) minimizing the cost of wasted capacity and the cost of capacity shortage.
- D) minimizing the cost of wasted capacity and minimizing capacity shortages.

Answer: C

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

27) An effective revenue management tactic when faced with seasonal peaks is to charge a

- A) high price during the peak period and a higher price during off-peak periods.
- B) higher price during the peak period and a lower price during off-peak periods.
- C) lower price during the peak period and a higher price during off-peak periods.
- D) low price during the peak period and a lower price during off-peak periods.

Answer: B

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Reflective thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

Scenario 16.2 - Card Table Vendor

The traditional fundraiser for the student chapter of APICS is pint mason jars filled with a tangy barbecue sauce that the club sponsor whips up in his kitchen. Club officers set up a card table in the atrium of the business building and take turns staffing it for the duration of the barbecue season, which is four months. Eighteen sad years of experience have revealed that demand varies depending on the month of the season. Customer demand in the first month can be described as $400 - p_1$, in the second month as $400 - 1.4p_2$, in the third month $400 - 1.8p_3$, and in the fourth month $400 - 2.2p_4$.

28) What should the price be in period 1?

- A) \$287.50
- B) \$275.00
- C) \$262.50
- D) \$250.00

Answer: C

Diff: 3

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

29) What should the price be in period 3?

- A) \$185.13
- B) \$181.27
- C) \$177.43
- D) \$173.61

Answer: D

Diff: 3

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

30) What is the expected revenue if the student APICS chapter uses dynamic pricing?

- A) \$83,975.47
- B) \$84,349.06
- C) \$84,719.84
- D) \$85,209.84

Answer: A

Diff: 3

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

31) Responding to customer complaints (primarily from period 1 purchasers) the student APICS chapter decides to use static pricing over the four month season. What is the optimal price to charge for their barbecue sauce?

- A) \$122.50
- B) \$125.00
- C) \$127.50
- D) \$130.00

Answer: B

Diff: 3

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

32) Responding to customer complaints (primarily from period 1 purchasers) the student APICS chapter decides to use static pricing over the four month season. What is the total revenue for the season's sales at the optimal price?

- A) \$49,490.00
- B) \$494,747.50
- C) \$50,000.00
- D) \$50,247.50

Answer: C

Diff: 3

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

Scenario 16.3 - AITP's Revenge

The student chapter of the Association of Information technology Professionals (AITP) notices the success that the APICS student chapter has with their traditional barbecue sauce fundraiser. Blinded by their jealousy, the club officers decide to sell a competing product, clocks made out of junk computer parts that the club sponsor whips up in his garage. Club officers set up a card table in the atrium of the business building and take turns staffing it for the duration of the computer clock season, which is four months. Twenty-five years of experience have revealed that demand varies depending on the month of the season. Customer demand in the first month can be described as $20 - p_1$, in the second month as $20 - 1.4p_2$, in the third month $20 - 1.8p_3$, and in the fourth month $20 - 2.2p_4$.

33) The components needed to produce a computer clock cost twenty-five cents. What should the price of the computer clocks be in the first month of the selling season?

- A) \$5.68
- B) \$7.27
- C) \$10.13
- D) \$14.52

Answer: C

Diff: 3

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

34) The components needed to produce a computer clock cost twenty-five cents. What should the price of the computer clocks be in the third month of the selling season?

- A) \$14.52
- B) \$10.13
- C) \$7.27
- D) \$5.68

Answer: D

Diff: 3

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

35) The components needed to produce a computer clock cost twenty-five cents. How many clocks should the AITP club produce?

- A) 39
- B) 47
- C) 55
- D) 63

Answer: A

Diff: 3

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

36) The components needed to produce a computer clock cost twenty-five cents. What is the expected profit if the AITP club sponsor produces the optimal number of clocks?

- A) \$263.72
- B) \$262.54
- C) \$260.97
- D) \$269.41

Answer: B

Diff: 3

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

37) Shifting demand from peak to off-peak periods is beneficial if the discount given

- A) during the off-peak period is more than offset by the decrease in cost because of a larger peak.
- B) during the off-peak period is more than offset by the decrease in cost because of a smaller peak.
- C) during the peak period is more than offset by the decrease in cost because of a smaller peak.
- D) during the peak period is more than offset by the decrease in cost because of a larger peak.

Answer: A

Diff: 2

Topic: 16.4 Pricing and Revenue Management for Seasonal Demand

AACSB: Reflective thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

38) Hotels use differential pricing by day of week and time of year

- A) in order to shift demand from peak periods to off-peak periods.
- B) in order to increase demand during off-peak periods.
- C) in order to shift revenue from peak periods to off-peak periods.
- D) in order to shift profit from peak periods to off-peak periods.

Answer: B

Diff: 2

Topic: 16.4 Pricing and Revenue Management for Seasonal Demand

AACSB: Reflective thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

- 39) Most firms must decide what fraction of an asset to
- A) sell in bulk and what fraction of the asset to discard.
 - B) save for the spot market and what fraction of the asset to discard.
 - C) save for emergencies and what fraction of the asset to rework.
 - D) sell in bulk and what fraction of the asset to save for the spot market.

Answer: D

Diff: 2

Topic: 16.4 Pricing and Revenue Management for Seasonal Demand

AACSB: Reflective thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

- 40) The fundamental trade-off between selling in bulk or on the spot market is
- A) different from the situation where a firm serves two market segments.
 - B) similar to the case when a firm serves two market segments.
 - C) similar to the case where a firm must deal with seasonal demand.
 - D) similar to the case where a firm has a perishable asset.

Answer: B

Diff: 3

Topic: 16.5 Pricing and Revenue Management for Bulk and Spot Contracts

AACSB: Reflective thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

- 41) The amount reserved for the spot market should be
- A) such that the expected marginal revenue from the spot market equals the current revenue from a bulk sale.
 - B) such that the expected marginal revenue from the spot market exceeds the current revenue from a bulk sale.
 - C) such that the expected marginal revenue from the spot market is less than the current revenue from a bulk sale.
 - D) equal to the maximum revenue available from the spot.

Answer: A

Diff: 3

Topic: 16.5 Pricing and Revenue Management for Bulk and Spot Contracts

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

Scenario 16.4 - Santorini Donkeys

Sturdy little donkeys are used to carry corpulent tourists up the Santorini caldera to the town of Fira. One cruise line that routinely docks at the port is considering a plan to maintain their own donkey herd, which will cost them \$15,000 per thousand tourists. The number of tourists needing this service is normally distributed, with a mean of Usually, this is enough donkey capacity, but occasionally the cruise line rotates a bigger ship through this route and the excursion director must purchase donkey capacity on the spot market, where is costs \$20 per tourist.

42) How many donkeys should the cruise line have in its herd?

- A) 8,111
- B) 7,977
- C) 7,842
- D) 7,707

Answer: B

Diff: 3

Topic: 16.5 Pricing and Revenue Management for Bulk and Spot Contracts

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

43) Once a local donkey herder learns of the cruise line's plan, he raises his donkey rental price to \$25 per tourist. How many donkeys should be in the cruise line's herd?

- A) 9,111
- B) 8,971
- C) 9,139
- D) 8,707

Answer: C

Diff: 3

Topic: 16.5 Pricing and Revenue Management for Bulk and Spot Contracts

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

44) Once a local donkey herder learns of the cruise line's plan, he lowers his donkey rental price to \$17.50 per tourist. How many donkeys should be in the cruise line's herd?

- A) 7,264
- B) 7,005
- C) 6,711
- D) 6,370

Answer: D

Diff: 3

Topic: 16.5 Pricing and Revenue Management for Bulk and Spot Contracts

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

45) The cruise line's insurance policy limits the number of donkeys in their herd to 5,000. What bulk price should the cruise line negotiate to make the 5,000 donkey herd size optimal?

- A) \$18,586 per ten thousand
- B) \$18,362 per ten thousand
- C) \$18,134 per ten thousand
- D) \$17,978 per ten thousand

Answer: A

Diff: 3

Topic: 16.5 Pricing and Revenue Management for Bulk and Spot Contracts

AACSB: Analytical thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

46) The forecasting function is

- A) the foundation of any revenue management system.
- B) unnecessary for a revenue management system.
- C) an added plus for any revenue management system.
- D) likely to create problems for any revenue management system.

Answer: A

Diff: 2

Topic: 16.6 Using Pricing and Revenue Management in Practice

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

47) The goal of optimization in revenue management is to identify a tactic

- A) using forecasts of customer behavior that will be most effective.
- B) using linear regression that will maximize revenue.
- C) using linear regression that will minimize cost.
- D) that will not have to be altered.

Answer: A

Diff: 2

Topic: 16.6 Using Pricing and Revenue Management in Practice

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

48) The decision to use overbooking will

- A) lead to upset customers and a high cost of providing them space.
- B) lead to unutilized assets and lost revenue.
- C) lead to reduced profits.
- D) depend upon optimization to be successful.

Answer: D

Diff: 2

Topic: 16.6 Using Pricing and Revenue Management in Practice

AACSB: Reflective thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

- 49) It is important for the firm to structure its revenue management program in a way that
- A) it is presented simply as a mechanism for extracting maximum revenue.
 - B) revenue increases while improving service along some dimension that is important to customers that pay the highest price.
 - C) profit is maximized.
 - D) all of the above

Answer: B

Diff: 2

Topic: 16.6 Using Pricing and Revenue Management in Practice

AACSB: Reflective thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

- 50) In order to achieve the greatest value

- A) supply planning and revenue management should be performed separately.
- B) supply planning should be completed first.
- C) supply planning and revenue management should be combined.
- D) revenue management should be completed first.

Answer: C

Diff: 3

Topic: 16.6 Using Pricing and Revenue Management in Practice

AACSB: Analytical thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

16.3 Essay Questions

- 1) Describe the role of revenue management.

Answer: Pricing is an important lever to increase supply chain profits by better matching supply and demand. Pricing may influence demand if customers are price sensitive. *Revenue management* is the use of pricing to increase the profit generated from a limited supply of supply chain assets. Supply chain assets exist in two forms—capacity and inventory. Capacity assets in the supply chain exist for production, transportation, and storage. Inventory assets exist throughout the supply chain and are carried to improve product availability.

Management decisions should try to maximize the total margin earned from these assets. To increase the total margin, managers must use all available levers, including price. This is the primary role of revenue management. Traditionally, firms have often invested in or eliminated assets to reduce the imbalance between supply and demand. Firms build additional capacity during the growth part of a business cycle and shut some of the capacity down during a downturn. Ideas from revenue management suggest that a firm should first use pricing to achieve some balance between supply and demand, and only then invest in or eliminate assets. Revenue management may also be defined as the use of differential pricing based on customer segment, time of use, and product or capacity availability to increase supply chain surplus.

Diff: 2

Topic: 16.1 The Role of Pricing and Revenue Management in a Supply Chain

AACSB: Application of knowledge

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

2) Explain how revenue management is beneficial.

Answer: Revenue management adjusts the pricing and available supply of assets to maximize profits. Revenue management has a significant impact on supply chain profitability when one or more of the following four conditions exist:

1. The value of the product varies in different market segments.
2. The product is highly perishable or product wastage occurs.
3. Demand has seasonal and other peaks.
4. The product is sold both in bulk and the spot market.

Revenue management can be a powerful tool for every owner of assets in a supply chain. Owners of any form of capacity (production, transportation, or storage) can use revenue management if there is seasonal demand or if there are segments that are willing to pay different prices for different lead times to use the capacity. Revenue management can be effective if there is a segment that wants to use capacity at the last minute and is willing to pay for it, and there is another segment that wants a lower price and is willing to commit far in advance. Revenue management is essential for owners of any perishable inventory. Most successful examples of the use of revenue management are from the travel and hospitality industry and include airlines, car rentals, and hotels. Revenue management can have a similar impact on all stages of a supply chain that satisfy one or more of these four conditions.

Diff: 2

Topic: 16.1 The Role of Pricing and Revenue Management in a Supply Chain

AACSB: Application of knowledge

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

3) Explain how differential pricing can benefit a firm.

Answer: If a supplier serves multiple customer segments with a fixed asset, he or she can improve revenues by setting different prices for each segment. In theory, the concept of differential pricing increases total profits for a firm. There are two fundamental issues, however, that must be handled in practice. First, the firm must differentiate between the two segments and structure its pricing to make one segment pay more than the other. To differentiate between the various segments, the firm must create barriers by identifying product or service attributes that the segments value differently. Second, the firm must control demand such that the lower paying segment does not utilize the entire availability of the asset. The amount of the asset reserved for the higher price segment is such that the expected marginal revenue from the higher priced segment equals the price to the lower price segment. Prices must be set with barriers such that the segment willing to pay more is not able to pay the lower price.

To successfully use revenue management when serving multiple customer segments, a firm must use the following tactics effectively:

- Price based on the value assigned by each segment.
- Use different prices for each segment.
- Forecast at the segment level.

Diff: 2

Topic: 16.1 The Role of Pricing and Revenue Management in a Supply Chain

AACSB: Application of knowledge

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

4) How do firms address the problems of spoilage and spill?

Answer: In most instances of differential pricing, demand from the segment paying the lower price arises earlier in time than demand from the segment paying the higher price. The basic trade-off to be considered by the supplier with production capacity is between committing to an order from a lower price buyer and waiting for a high-price buyer to arrive later on. The two risks in such a situation are spoilage and spill. Spoilage occurs when the capacity reserved for higher price buyers is wasted because demand from the higher price segment does not materialize. Spill occurs if higher price buyers have to be turned away because the capacity has already been committed to lower price buyers.

The supplier should decide on the capacity to commit for the higher price buyers so as to minimize the expected cost of spoilage and spill. A current order from a lower price buyer should be compared with the expected revenue from waiting for a higher price buyer. The order from the lower price buyer should be accepted if the expected revenue from the higher price buyer is lower than the current revenue from the lower price buyer.

Diff: 2

Topic: 16.2 Pricing and Revenue Management for Multiple Customer Segments

AACSB: Reflective thinking

Objective: LO 16.3: Describe trade-offs that must be considered when making revenue management decisions.

5) How can firms address the problem of perishable assets?

Answer: Any asset that loses value over time is perishable.

The two revenue management tactics used for perishable assets are:

1. Vary price over time to maximize expected revenue.
2. Overbook sales of the asset to account for cancellations.

The tactic of varying price over time is suitable for assets such as fashion apparel that have a clear date beyond which they lose a lot of their value. To effectively vary price over time for a perishable asset, the asset owner must be able to estimate the value of the asset over time and effectively forecast the impact of price on customer demand. Effective differential pricing over time will generally increase the level of product availability for the consumer willing to pay full price and also increase total profits for the retailer.

The tactic of overbooking or overselling the available asset is suitable in any situation where customers are able to cancel orders and the value of the asset drops significantly after a deadline. If the cancellation or the return rate can be predicted accurately, the overbooking level is easy to determine. In practice, however, the cancellation or return rate is uncertain.

The basic trade-off to consider during overbooking is between having wasted capacity (or inventory) because of excessive cancellations and having a shortage of capacity (or inventory) because of few cancellations, in which case an expensive backup needs to be arranged. The cost of wasted capacity is the margin that would have been generated if the capacity had been used for production. The cost of a capacity shortage is the reduction in margin that results from having to go to a backup source. The goal when making the overbooking decision is to maximize supply chain profits by minimizing the cost of wasted capacity and the cost of capacity shortage.

Diff: 2

Topic: 16.3 Pricing and Revenue Management for Perishable Assets

AACSB: Reflective thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

6) Explain why forecasting is important to revenue management.

Answer: The foundation of any revenue management system is the forecasting function. To use overbooking with any degree of success, a firm must be able to forecast cancellation patterns. Forecasting does not mean obtaining an estimate that is always accurate. Forecasting involves estimating demand and also attributing an expected error to the forecast itself. Both the estimated value and the expected error are important inputs into any revenue management model. Finally, as new information becomes available, reforecast to see if the revenue management tactics currently in place are still appropriate. The frequency of forecasting will depend on the amount of market activity. Ideally, the forecast and the revenue management decision should be evaluated after every transaction.

Diff: 2

Topic: 16.6 Using Pricing and Revenue Management in Practice

AACSB: Reflective thinking

Objective: LO 16.1: Understand the role of revenue management in a supply chain.

7) A manufacturer of industrial sales has production capacity of 1,000 units per day. Currently, the firm sells production capacity for \$10 per unit. At this price, all production capacity gets booked about one week in advance. A group of customers have said that they would be willing to pay \$15 per unit if capacity was available on the last day. About ten days in advance, demand for the high-price segment is normally distributed with a mean of 250 and a standard deviation of 100. How much production capacity should the manufacturer reserve for the last day?

Answer:

Revenue from segment A, $p_A = \$15$ per unit

Revenue from segment B, $p_B = \$10$ per unit

Mean demand for segment A, $D_A = 250$ units

Standard deviation of demand for segment A, $\sigma_A = 100$ units

$$\begin{aligned} C_A &= \text{NORMINV}(1 - p_B/p_A, D_A, \sigma_A) \\ &= \text{NORMINV}(1 - 10/15, 250, 100) \\ &= 206.9272 \approx 207 \text{ units of capacity} \end{aligned}$$

Diff: 2

Topic: 16.6 Using Pricing and Revenue Management in Practice

AACSB: Information technology

Objective: LO 16.1: Understand the role of revenue management in a supply chain.