

13.1 Explain how the relative strength of competitive forces help managers identify strategic alternatives.

1) Strategies have been classified in many different ways, but what is common is to set the business within its external environment.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-1

2) Cost leadership is an organization's ability to offer products or services that are perceived by its own customers as being superior and unique relative to those of its competitors.

Answer: FALSE

Explanation: **Price differentiation** is an organization's ability to offer products or services that are perceived by its own customers as being superior and unique relative to those of its competitors.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-1

3) \_\_\_\_\_ has/have been classified in many ways, but what is common is to set the business within its external environment.

A) Strategies

B) Planning

C) Competitors

D) Bargaining power of input suppliers

E) Cost Leadership

Answer: A

Diff: 1 Type: MC

Skill: Remember

Objective: LO 13-1

4) Which of the following is NOT a force that shapes an organization's competitive environment?

A) competitors

B) equivalent products

C) bargaining power of customers

D) government regulation

E) potential entrants into the market

Answer: D

Diff: 2 Type: MC

Skill: Remember

Objective: LO 13-1

5) According to Michael Porter which of the following is a force that shapes an organization's competitive environment?

- A) investors
- B) potential entrants into the market
- C) lenders
- D) research and development
- E) bankers

Answer: B

Diff: 2 Type: MC

Skill: Remember

Objective: LO 13-1

6) \_\_\_\_\_ is an organization's ability to offer products or services that are perceived by its customers as being superior and unique relative to those of its competitors.

- A) Strategy
- B) Product differentiation
- C) Cost leadership
- D) The balanced scorecard
- E) Cost differentiation

Answer: B

Diff: 1 Type: MC

Skill: Remember

Objective: LO 13-1

7) \_\_\_\_\_ is an organization's ability to achieve low costs relative to competitors through productivity and efficiency improvements, elimination of waste, and tight cost control.

- A) Strategy
- B) Product differentiation
- C) Cost leadership
- D) The balanced scorecard
- E) Product leadership

Answer: C

Diff: 1 Type: MC

Skill: Remember

Objective: LO 13-1

8) An organization that is using the product differentiation approach would

- A) focus on tight cost control.
- B) carefully cultivate its brands.
- C) provide products that are similar to competitors.
- D) invest more in productivity enhancements than R&D.
- E) recognize that demand is more price sensitive than if using a cost leadership approach.

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-1

- 9) An organization that is using the cost leadership approach would
- A) incur costs for innovative R&D.
  - B) provide products at a higher price but with lower costs than its competitors.
  - C) focus on productivity through efficiency improvements.
  - D) bring products to market rapidly.
  - E) use a cost plus rather than a target pricing policy.

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-1

*Answer the following questions using the information below:*

Stewart Corporation plans to grow by offering a sound system, the SS3000, that is superior and unique from the competition. Stewart believes that putting additional resources into R&D and staying ahead of the competition with technological innovations is critical to implementing its strategy.

- 10) Stewart's strategy is
- A) product differentiation.
  - B) downsizing.
  - C) reengineering.
  - D) cost leadership.
  - E) salability.

Answer: A

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-1

- 11) Identify and explain Porter's Five Forces model.

Answer: Porter identified five competitive forces that all corporations face and argued that understanding each of these five forces was key to successful strategic decisions. Understanding the five forces will determine the level of competitive rivalry in the business environment and enable allow companies to best exploit their core competencies to outperform the competition. The five forces are:

1. Threat of existing competitors. Is the environment highly competitive? This tends to lower revenues.
2. Threat of potential new entrants. Are there technological or investment barriers to entry? Are profits sufficiently high to attract new entrants? Low barriers to entry tend to lower revenues.
3. Threat of substitute products. Availability of substitute products increases the competitive environment and lower revenue.
4. Bargaining power of customers. Do customers have monopoly power? Can they successfully negotiate lower prices?
5. Bargaining power of suppliers. In monopoly or oligopoly environments the suppliers have high power. These environments tend to increase the cost of supplies.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 13-1

12) Explain the product differentiation and the cost leadership strategies.

Answer: Product differentiation is an organization's ability to offer products or services perceived by its customers to be superior and unique relative to the products or services of its competitors.

Cost leadership is an organization's ability to achieve lower costs relative to competitors through productivity and efficiency improvements, elimination of waste, and tight cost control.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 13-1

13) Bosely Corporation is reviewing its business strategy. The first step for Bosely is to evaluate the competitive environment. You have been hired to help the company go through the strategy formulation process.

Required:

To perform the analysis of competitive rivalry, what areas should Bosely focus on and give at least one example of how Bosely can effectively deal with each area.

Answer: The industry analysis is composed of five areas:

1. Competitors - How competitive is the industry for Bosely's particular product? It can differentiate the product to reduce competition.

2. Potential entrants to the market - How easy is it for new competitors to join the market? Create barriers to entry, such as high capital requirements.

3. Equivalent products - Is there a substitute product available? Make continuous product improvements to reduce likelihood of equivalent products.

4. Bargaining power of customers - How many suppliers can customers access? Try to negotiate long-term purchase agreements.

5. Bargaining power of input suppliers - How many raw material vendors are there? Try to find alternative suppliers and negotiate the best price for raw materials.

Diff: 3 Type: ES

Skill: Understand

Objective: LO 13-1

13.2 Understand reengineering.

1) Strategy requires integration of product and process development.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-2

2) To achieve a cost leadership strategy companies may need to improve their internal production processes to increase yield.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-2

3) Reengineering is the fundamental rethinking and redesign of business processes to achieve improvements in critical measures of performance such as cost, quality, service, speed, and customer satisfaction.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-2

4) Reengineering benefits are most significant when they focus on one business function rather than crossing functional lines of the business process.

Answer: FALSE

Explanation: Reengineering benefits are most significant when they cut across functional lines to focus on the entire business process.

Diff: 2 Type: TF

Skill: Understand

Objective: LO 13-2

5) Successful reengineering efforts generally involve changing the roles and responsibilities of employees.

Answer: TRUE

Diff: 2 Type: TF

Skill: Understand

Objective: LO 13-2

6) In general, profit potential increases with greater competition, stronger potential entrants, products that are similar, and tougher customers and suppliers.

Answer: FALSE

Explanation: In general, profit potential *decreases* with greater competition, stronger potential entrants, products that are similar, and tougher customers and suppliers.

Diff: 2 Type: TF

Skill: Understand

Objective: LO 13-2

7) \_\_\_\_\_ is the fundamental rethinking and redesign of business processes to achieve improvements in critical measures of performance such as cost, quality, service, speed, and customer satisfaction.

A) Strategy

B) Customer perspective

C) Learning and growth perspective

D) Reengineering

E) Product differentiation

Answer: D

Diff: 1 Type: MC

Skill: Remember

Objective: LO 13-2

- 8) Successful reengineering involves all of the following EXCEPT
- A) cutting across functional lines to focus on the entire business process.
  - B) redefining the roles and responsibilities of employees.
  - C) using information technology.
  - D) entering new geographic markets.
  - E) improving customer satisfaction.

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-2

- 9) What is reengineering? Can you contrast a reengineering approach to change with a Kaizen approach to change?

Answer: Reengineering is the rethinking of business processes, such as the order delivery process, to improve critical performance measures such as cost, quality, or customer satisfaction. It can be contrasted to a Kaizen approach to change in that reengineering is most often a sudden, drastic change, while a Kaizen approach involves small, incremental but continual improvements.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 13-2

### 13.3 Understand the four perspectives of the balanced scorecard.

- 1) The accounting scorecard translates an organization's mission and strategy into a comprehensive set of performance measures that provides the framework for implementing its strategy.

Answer: FALSE

Explanation: The **balanced** scorecard translates an organization's mission and strategy into a comprehensive set of performance measures that provides the framework for implementing its strategy.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-3

- 2) The internal business process perspective focuses on internal operations that further both the customer perspective by creating value for customers and the financial perspective by increasing shareholder wealth.

Answer: TRUE

Explanation: **Internal** business process perspective focuses on internal operations that further both the customer perspective by creating value for customers and the financial perspective by increasing shareholder wealth.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-3

3) Learning and growth perspective identifies the capabilities in which the organization must excel to achieve superior internal processes that create value for customers and shareholders.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-3

4) When implementing a balanced scorecard, one should assume the cause-and-effect linkage to be precise.

Answer: FALSE

Explanation: When implementing a balanced scorecard, one should not assume the cause-and-effect linkage to be precise.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-3

5) Employee satisfaction is a measure of the internal business process perspective of the balanced scorecard.

Answer: FALSE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-3

6) \_\_\_\_\_ translates an organization's mission and strategy into a comprehensive set of performance measures that provides the framework for implementing its strategy.

A) Corporate vision

B) Product differentiation

C) Cost leadership

D) The balanced scorecard

E) Planning

Answer: D

Diff: 1 Type: MC

Skill: Remember

Objective: LO 13-3

7) The return-on-investment ratio is an example of a scorecard measure under the

A) internal business process.

B) customer perspective.

C) financial perspective.

D) learning and growth perspective.

E) manufacturing perspective.

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

- 8) The number of complaints about the company's product is a potential measure of the
- A) financial perspective.
  - B) shareholder value.
  - C) internal business process.
  - D) learning and growth perspective.
  - E) customer perspective.

Answer: E

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

- 9) Manufacturing cycle efficiency is a potential measure of the
- A) financial perspective.
  - B) customer perspective.
  - C) internal business process perspective.
  - D) learning and growth perspective.
  - E) real-time feedback capacity.

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

- 10) Surveys of employee satisfaction is a potential measure of the
- A) financial perspective.
  - B) customer perspective.
  - C) internal business process perspective.
  - D) learning and growth perspective.
  - E) shareholder value.

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3



Use the information below to answer the following question(s).

Following a strategy of product differentiation, Luke Company makes a high-end Appliance, AP15. Luke Company presents the following data for the years 1 and 2.

	<u>Year 1</u>	<u>Year 2</u>
Units of AP15 produced and sold	20,000	21,000
Selling price	\$200	\$220
Direct materials (square metres)	60,000	61,500
Direct materials costs per square metre	\$20	\$22
Manufacturing capacity for AP15 (units)	25,000	25,000
Total manufacturing conversion costs	\$1,000,000	\$1,100,000
Manufacturing conversion costs (per unit of capacity)	\$40	\$44
Selling and customer- service capacity (customers)	60	58
Total selling and customer-service costs	\$360,000	\$362,500
Cost per customer of selling and customer-service capacity	\$6,000	\$6,250

Luke Company produces no defective units but it wants to reduce direct materials usage per unit of AP15 in year 2. Manufacturing conversion costs in each year depend on production capacity defined in terms of AP15 units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Neither conversion costs or customer-service costs are affected by changes in actual volume. Luke Company has 46 customers in year 1 and 50 customers in year 2. The industry market size for high-end appliances increased 5% from year 1 to year 2.

11) Referring to Luke Company, which of the following is a measure of the financial perspective?

- A) reengineering process
- B) market share in the high-end appliance market
- C) order delivery time
- D) production cycle time
- E) operating income growth from changing higher margins

Answer: E

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

12) Referring to Luke Company, which of the following is a measure of the customer perspective?

- A) return on investment
- B) market share in the high-end appliance market
- C) development of new products or services
- D) production cycle time
- E) revenue growth

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

13) Referring to Luke Company, which of the following is a measure of the internal business process

perspective?

- A) return on investment
- B) market share in the high-end appliance market
- C) timely delivery
- D) production cycle time
- E) number of employees trained in quality management

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

14) Referring to Luke Company, which of the following is an objective of the learning and growth perspective?

- A) increase return on investment
- B) increase market share in the high-end appliance market
- C) improve order delivery time
- D) development of new products or services
- E) increase customer satisfaction

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

Use the information below to answer the following question(s).

Following a strategy of product differentiation, Barry Company makes an XX 300. Barry Company presents the following data for the years 1 and 2.

	<u>Year 1</u>	<u>Year 2</u>
Units of XX 300 produced and sold	10,000	10,800
Selling price	\$100	\$115
Direct materials (litres)	30,000	31,900
Direct materials costs per litre	\$15	\$16
Manufacturing capacity for XX 300 (units)	12,500	12,500
Total manufacturing conversion costs	\$250,000	\$275,000
Manufacturing conversion costs (per unit of capacity)	\$20	\$22
Selling and customer-service capacity (customers)	30	29
Total selling and customer-service costs	\$90,000	\$90,625
Cost per customer of selling and customer-service capacity	\$3,000	\$3,120

Barry Company produces no defective units but it wants to reduce direct materials usage per unit of XX 300 in year 2. Manufacturing conversion costs in each year depend on production capacity defined in terms of XX 300 units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Neither conversion costs or customer-service costs are affected by changes in actual volume. Barry Company has 23 customers in year 1 and 25 customers in year 2. The industry market size for high-end appliances increased 5% from year 1 to year 2.

15) Referring to Barry Company, which of the following is a measure of the financial perspective?

- A) order delivery time
- B) reengineering
- C) operating income growth from charging higher margins for XX 300
- D) improving manufacturing processes
- E) market share in the high-end appliance market

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

16) Referring to Barry Company, which of the following is a measure of the customer perspective?

- A) operating income growth from charging higher margins for XX 300
- B) yield
- C) production cycle time
- D) improving manufacturing processes
- E) customer satisfaction rating

Answer: E

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

17) Referring to Barry Company, which of the following is a measure of the internal business process perspective?

- A) operating income growth from charging higher margins for XX 300
- B) market share in the high-end appliance market
- C) production cycle time
- D) number of employees trained in quality management
- E) real-time customer feedback

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

18) Referring to Barry Company, which of the following is a measure of the learning and growth perspective?

- A) operating income growth from charging higher margins for XX 300
- B) market share in the high-end appliance market
- C) order delivery time
- D) number of employees trained in quality management
- E) customer satisfaction

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

19) The purpose of the balanced scorecard is BEST described as helping an organization

- A) develop customer relations.
- B) mobilize employee skills for continuous improvements in processing capabilities, quality, and response times.
- C) introduce innovative products and services desired by target customers.
- D) translate an organization's mission and strategy into a set of performance measures that help to implement the strategy.
- E) develop supplier relations.

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

20) Measures of the balanced scorecard's financial perspective include all of the following EXCEPT

- A) operating income.
- B) customer satisfaction.
- C) gross profit percentage.
- D) cost reductions.
- E) return on investment.

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

21) Measures of the balanced scorecard's customer perspective include all of the following EXCEPT

- A) market share.
- B) customer satisfaction.
- C) number of new customers.
- D) employee training on new products.
- E) number of repeat customers.

Answer: D

Diff: 3 Type: MC

Skill: Remember

Objective: LO 13-3

22) Measures of the balanced scorecard's internal business process perspective include all of the following EXCEPT

- A) operating capabilities.
- B) number of new products.
- C) employee turnover rates.
- D) defect rates.
- E) production cycle time.

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-3

23) Which of the following is NOT true of a good balanced scorecard?

- A) It tells the story of a company's strategy by articulating a sequence of cause-and-effect relationships.
- B) It helps to communicate corporate strategy to all members of the organization.
- C) It identifies all measures, whether significant or small, that help to implement strategy.
- D) It uses nonfinancial measures to serve as leading indicators of future financial performance.
- E) It incorporates both financial and nonfinancial measures.

Answer: C

Diff: 3 Type: MC

Skill: Understand

Objective: LO 13-3

24) Which of the following is a feature of a good balanced scorecard?

- A) It tells the story of a company's strategy by articulating costs along the value chain.
- B) It helps to communicate the strategy to all members of the organization by translating the strategy into a coherent and linked set of understandable and measurable operational targets.
- C) The scorecard measures match those of other companies.
- D) It provides cause-and-effect linkages that are precise.
- E) The scorecard contains dozens of different measures across many different categories.

Answer: B

Diff: 3 Type: MC

Skill: Understand

Objective: LO 13-3

*Answer the following questions using the information below:*

Riter Corporation manufactures water toys. It plans to grow by producing high-quality water toys at a low cost that are delivered in a timely manner. There are a number of other manufacturers who produce similar water toys. Riter believes that continuously improving its manufacturing processes are critical to implementing its strategy.

25) To execute the company strategy, measures on the balanced scorecard would most likely include the

- A) number of process improvements.
- B) price premium earned.
- C) market share.
- D) the amount invested in new product features.
- E) employee satisfaction.

Answer: A

Diff: 3 Type: MC

Objective: LO 13-3

26) Wondergardens Ltd. operates amusement parks similar to those such as Six Flags, Universal Studios, Disneyland etc. Wondergardens' mission is to provide high quality family entertainment that exceed guests' expectations and will create lifelong memories. To achieve this goal, Wondergardens strives to provide safe, clean, friendly family environments at reasonable prices. In addition to the amusement parks, the company operates a community outreach program. Through volunteerism, it offers educational and recreational programs (e.g. after school programs for children and teenagers, employment related training for adults) and special events at its facilities.

Wondergardens' president, Roland Coaster, has asked you to lead a team of employees in developing a balanced scorecard for its parks.

Required:

For each balanced scorecard perspective identify two measures of performance that relate to Wondergardens' key success factors.

Answer: This is intended to be an open ended question and individual responses should be evaluated on their own merit. A good answer will identify relevant quantifiable performance measures and clearly link these to the mission. Some possible answers include:

*Financial Perspective:* Any traditional financial measures (such as stock price, profit margins, etc.) may be used since this is a corporation that needs to provide returns to its shareholders. Because the company has established "reasonable prices" as part of its mission, it may measure its admission fees relative to its competitors.

*Customer Perspective:* Customer satisfaction would be of paramount importance. The company should survey its guests to include measures of satisfaction. Specifically it should question the customers about the cleanliness of its grounds, and its ranking of expectations (i.e. did your recent visit Meet, Exceed, Fall Below expectations?). Surveys would be tabulated and scored and a target set. (i.e. 75% "exceed" rating). The company could also measure number of repeat customers which would suggest that customers enjoyed their experiences.

*Internal Business Processes Perspective:* Recommended measures might include number of new attractions, average wait time for attractions. New attractions would not only draw in customers but contribute to exceeding expectations and creating memories. Shorter wait times also directly link to customer satisfaction.

*Learning & Growth:* Since the company is involved in outreach activities, it may wish to measure the percentage of employees who volunteer in these programs. Percentage or number of employees trained is another measure that can be considered.

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-3

27) Buck Corporation plans to grow by offering a computer monitor, the CM3000 that is superior and unique from the competition. Buck believes that putting additional resources into R&D and staying ahead of the competition with technological innovations are critical to implementing its strategy.

Required:

- a. Is Buck's strategy one of product differentiation or cost leadership? Explain briefly.
- b. Identify at least one key measure for each balanced scorecard perspective .

Answer:

- a. Buck's strategy is one of product differentiation because the company plans to offer a product that is superior and unique from the competition.
- b. The company's balanced scorecard should describe the product differentiation strategy. Key elements should include:

Financial perspective: operating income, ROI, and so forth

Customer perspective: market share in the high-end monitor market, customer satisfaction, and # of new customers

Internal business process perspective: manufacturing quality, new product features added, order delivery time, development time for new features, improvements in manufacturing technologies

Learning and growth perspective: employee education and skill levels, and employee satisfaction, investment in information technology

Diff: 3 Type: ES

Skill: Understand

Objective: LO 13-3



28) Maloney Corporation manufactures plastic water bottles. It plans to grow by producing high-quality water bottles at a low cost that are delivered in a timely manner. There are a number of other manufacturers who produce similar water bottles. Maloney believes that continuously improving its manufacturing processes and having satisfied employees are critical to implementing its strategy.

Required:

- a. Is Maloney's strategy one of product differentiation or cost leadership? Explain briefly.
- b. Identify at least one key measure for each balanced scorecard perspective.

Answer:

a. Maloney's strategy is one of cost leadership because there are a number of other manufacturers who produce similar water bottles. To succeed, Maloney will have to achieve lower costs relative to competitors through productivity and efficiency improvements, elimination of waste, and tight cost controls.

b. The company's balanced scorecard should describe the product differentiation strategy. Key elements should include:

Financial perspective: operating income growth from productivity gains and revenue growth from the ability to lower prices

Customer perspective: growth in market share, new customers, customer responsiveness, and customer satisfaction

Internal business process perspective: yield, time to complete customer jobs, order delivery time; cost per order;

Learning and growth perspective: employee education and skill levels, and employee satisfaction, investment in information technology

Diff: 2 Type: ES

Skill: Understand

Objective: LO 13-1, 4

29) What is the primary purpose of the balanced scorecard?

Answer: The primary purpose of the balanced scorecard is to translate an organization's mission and strategy into a set of performance measures that put that strategy into action with clearly-stated objectives, measures, targets, and initiatives.

Diff: 2 Type: ES

Skill: Remember

Objective: LO 13-3

30) What are the four key perspectives in the balanced scorecard?

Answer: The four key perspectives in the balanced scorecard are

- a. the financial perspective,
- b. the customer perspective,
- c. the internal business processes perspective, and
- d. the learning and growth perspective.

Diff: 1 Type: ES

Skill: Remember

Objective: LO 13-3

Match each of the following balanced scorecard measures with the appropriate perspective.

- A) learning and growth perspective
- B) customer perspective
- C) financial perspective
- D) internal business process perspective

31) service response time

Diff: 2 Type: MA

Skill: Understand

Objective: LO 13-3

32) market share

Diff: 2 Type: MA

Skill: Understand

Objective: LO 13-3

33) gross margin percentage

Diff: 2 Type: MA

Skill: Understand

Objective: LO 13-3

34) defect rates

Diff: 2 Type: MA

Skill: Understand

Objective: LO 13-3

35) customer satisfaction

Diff: 2 Type: MA

Objective: LO 13-3

36) information system availability

Diff: 2 Type: MA

Skill: Understand

Objective: LO 13-3

37) new product development time

Diff: 2 Type: MA

Skill: Understand

Objective: LO 13-3

38) return on investment

Diff: 2 Type: MA

Skill: Understand

Objective: LO 13-3

39) employee training hours

Diff: 2 Type: MA

Skill: Understand

Objective: LO 13-3

40) manufacturing cycle time

Diff: 2 Type: MA

Skill: Understand

Objective: LO 13-3

Answers: 31) D 32) B 33) C 34) D 35) B 36) D 37) D 38) C 39) A 40) D

13.4 Evaluate strategic success at implementing a cost leadership strategy using balanced scorecard measures.

1) The growth component measures the increase in revenues minus the increase in costs from selling more units of a product.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-4

2) The productivity component measures the reduction in costs attributable to a reduction in the quantity of inputs used in year 2 relative to the quantity of inputs that would have been used in year 1 to produce the year 2 output.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-4

3) To evaluate the success of its strategy, a company can subdivide the change in costs into growth, price-recovery and productivity components.

Answer: FALSE

Explanation: To evaluate the success of its strategy, a company can subdivide the change in **operating income** into growth, price-recovery and productivity components.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-4

4) The productivity component of operating income focuses exclusively on revenues.

Answer: FALSE

Explanation: The productivity component of operating income focuses exclusively on *costs*.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-4

5) The price-recovery component measures the increase in operating income from selling more units of a product.

Answer: FALSE

Explanation: The *growth* component measures the increase in operating income from selling more units of a product.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-4

6) Companies that have been successful at cost leadership will show large favorable price-recovery and growth components when analyzing profitability.

Answer: FALSE

Explanation: Companies that have successfully *differentiated* their products will show large favorable price-recovery and growth components when analyzing profitability.

Diff: 3 Type: TF

Skill: Understand

Objective: LO 13-4

7) The price-recovery component of a change in operating income from one year to the next measures the increase in operating income from selling more units of the product.

Answer: FALSE

Explanation: The growth component of a change in operating income from one year to the next measures the increase in operating income from selling more units of the product.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-4

8) The price-recovery component of a change in operating income measures the effect of price changes on revenues and costs.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-4

9) Unused capacity is the amount of productive capacity available over and above the productive capacity employed to meet customer demand in the current period.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-4

10) The growth component of a change in operating income measures the effect of price changes on revenues and costs.

Answer: FALSE

Explanation: The price-recovery component of a change in operating income measures the effect of price changes on revenues and costs.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-4

*Use the information below to answer the following question(s).*

Following a strategy of product differentiation, Luke Company makes a high-end Appliance, AP15. Luke Company presents the following data for the years 1 and 2.

	<u>Year 1</u>	<u>Year 2</u>
Units of AP15 produced and sold	20,000	21,000
Selling price	\$200	\$220
Direct materials (square metres)	60,000	61,500
Direct materials costs per square metre	\$20	\$22
Manufacturing capacity for AP15 (units)	25,000	25,000
Total manufacturing conversion costs	\$1,000,000	\$1,100,000
Manufacturing conversion costs (per unit of capacity)	\$40	\$44
Selling and customer- service capacity (customers)	60	58
Total selling and customer-service costs	\$360,000	\$362,500
Cost per customer of selling and customer-service capacity	\$6,000	\$6,250

Luke Company produces no defective units but it wants to reduce direct materials usage per unit of AP15 in year 2. Manufacturing conversion costs in each year depend on production capacity defined in terms of AP15 units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Neither conversion costs or customer-service costs are affected by changes in actual volume. Luke Company has 46 customers in year 1 and 50 customers in year 2. The industry market size for high-end appliances increased 5% from year 1 to year 2.

11) What is the Luke Company's operating income for year 1?

A) \$4,000,000

B) \$804,500

C) \$1,240,000

D) \$1,240,500

E) \$1,440,000

Answer: E

Explanation: E)  $(\$200 \times 20,000) - ((\$20 \times 60,000) + (\$40 \times 25,000) + (\$6,000 \times 60)) = \$1,440,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-4

12) What is the Luke Company's operating income in Year 2?

- A) \$1,804,500
- B) \$1,440,000
- C) \$4,620,000
- D) \$200,000
- E) \$188,000

Answer: A

Explanation: A)  $(\$220 \times 21,000) - ((\$22 \times 61,500) + (\$44 \times 25,000) + (\$6,250 \times 58)) = \$1,804,500$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-4

13) What is the Luke Company's change in operating income from year 1 to year 2?

- A) \$620,000 favourable
- B) \$364,500 unfavourable
- C) \$364,500 favourable
- D) \$200,000 favourable
- E) \$200,000 unfavourable

Answer: C

Explanation: C)  $\$1,440,000 - \$1,804,500 = \$364,500$  (F)

Diff: 3 Type: MC

Skill: Apply

Objective: LO 13-4

14) What is the Luke Company's revenue effect of growth component?

- A) \$440,000 favourable
- B) \$400,000 unfavourable
- C) \$400,000 favourable
- D) \$200,000 favourable
- E) \$220,000 favourable

Answer: D

Explanation: D)  $(21,000 - 20,000) \times \$200 = \$200,000$  (F)

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-4

15) What is the Luke Company's cost effect of growth component?

- A) \$60,000 unfavourable
- B) \$30,000 favourable
- C) \$60,000 favourable
- D) \$200,000 favourable
- E) \$30,000 unfavourable

Answer: A

Explanation: A)  $((63,000 - 60,000) \times \$20) + ((25,000 - 25,000) \times \$40) + ((60 - 60) \times \$6,000) = \$60,000$  (U)

$21,000 \times 60,000 / 20,000 = 63,000$  units of input

Diff: 3 Type: MC

Skill: Apply

Objective: LO 13-4

16) What is the Luke Company's net increase in operating income as a result of the growth component?

- A) \$340,000 unfavourable
- B) \$140,000 favourable
- C) \$160,000 favourable
- D) \$190,000 favourable
- E) \$250,000 unfavourable

Answer: B

Explanation: B)  $\$200,000 \text{ (F)} + \$60,000 \text{ (U)} = \$140,000 \text{ (F)}$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-4

17) What is the Luke Company's revenue effect of price-recovery component?

- A) \$400,000 favourable
- B) \$220,000 unfavourable
- C) \$400,000 unfavourable
- D) \$420,000 unfavourable
- E) \$420,000 favourable

Answer: E

Explanation: E)  $(\$220 - \$200) \times 21,000 = \$420,000 \text{ (F)}$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-4

18) What is the Luke Company's cost effect of price-recovery component?

- A) \$126,000 favourable
- B) \$126,000 unfavourable
- C) \$241,000 unfavourable
- D) \$420,000 favourable
- E) \$238,000 unfavourable

Answer: C

Explanation: C)  $((\$22 - \$20) \times 63,000) + ((\$44 - \$40) \times 25,000) + ((\$6,250 - \$6,000) \times 60)$   
 $= \$126,000 + \$100,000 + \$15,000 = \$241,000 \text{ (U)}$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 13-4

19) What is the Luke Company's net increase in operating income as a result of the price-recovery component?

- A) \$179,000 favourable
- B) \$179,000 unfavourable
- C) \$182,000 unfavourable
- D) \$20,000 favourable
- E) \$20,000 unfavourable

Answer: A

Explanation: A)  $\$420,000 \text{ (F)} + \$241,000 \text{ (U)} = \$179,000 \text{ (F)}$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 13-4

20) What is the Luke Company's productivity component of change in operating income?

- A) \$33,000 favourable
- B) \$45,500 favourable
- C) \$33,000 unfavourable
- D) \$45,500 unfavourable
- E) \$20,500 unfavourable

Answer: B

Explanation: B)  $((61,500 - 63,000) \times \$22) + ((25,000 - 25,000) \times \$40) + ((58 - 60) \times \$6,250) = \$45,500 \text{ (F)}$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 13-4



Use the information below to answer the following question(s).

Following a strategy of product differentiation, Barry Company makes an XX 300. Barry Company presents the following data for the years 1 and 2.

	<u>Year 1</u>	<u>Year 2</u>
Units of XX 300 produced and sold	10,000	10,800
Selling price	\$100	\$115
Direct materials (litres)	30,000	31,900
Direct materials costs per litre	\$15	\$16
Manufacturing capacity for XX 300 (units)	12,500	12,500
Total manufacturing conversion costs	\$250,000	\$275,000
Manufacturing conversion costs (per unit of capacity)	\$20	\$22
Selling and customer-service capacity (customers)	30	29
Total selling and customer-service costs	\$90,000	\$90,625
Cost per customer of selling and customer-service capacity	\$3,000	\$3,120

Barry Company produces no defective units but it wants to reduce direct materials usage per unit of XX 300 in year 2. Manufacturing conversion costs in each year depend on production capacity defined in terms of XX 300 units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Neither conversion costs or customer-service costs are affected by changes in actual volume. Barry Company has 23 customers in year 1 and 25 customers in year 2. The industry market size for high-end appliances increased 5% from year 1 to year 2.

21) What is the Barry Company's operating income for year 1?

- A) \$210,000
- B) \$366,120
- C) \$1,000,000
- D) \$260,000
- E) \$231,000

Answer: A

Explanation: A)  $(\$100 \times 10,000) - ((\$15 \times 30,000) + (\$20 \times 12,500) + (\$3,000 \times 30)) = \$210,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-4

22) What is the Barry Company's operating income in year 2?

- A) \$378,600
- B) \$366,120
- C) \$1,242,000
- D) \$403,520
- E) \$210,000

Answer: B

Explanation: B)  $(\$115 \times 10,800) - ((\$16 \times 31,900) + (\$22 \times 12,500) + (\$3,120 \times 29)) = \$366,120$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-4

23) What is the Barry Company's change in operating income from year 1 to year 2?

- A) \$147,600 favourable
- B) \$143,520 favourable
- C) \$156,120 favourable
- D) \$156,120 unfavourable
- E) \$242,000 favourable

Answer: C

Explanation: C)  $\$366,120 - \$210,000 = \$156,120$  (F)

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-4

24) What is the Barry Company's revenue effect of growth component?

- A) \$92,000 favourable
- B) \$92,000 unfavourable
- C) \$80,000 unfavourable
- D) \$162,000 favourable
- E) \$80,000 favourable

Answer: E

Explanation: E)  $(10,800 - 10,000) \times \$100 = \$80,000$  (F)

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-4

25) What is the Barry Company's cost effect of growth component?

- A) \$7,500 favourable
- B) \$28,500 favourable
- C) \$7,500 unfavourable
- D) \$28,500 unfavourable
- E) \$30,000 favourable

Answer: C

Explanation: C)  $((32,400 - 31,900) \times \$15) + ((12,500 - 12,500) \times \$20) + ((30 - 30) \times \$3,120) = \$7,500$  (U)

Diff: 3 Type: MC

Skill: Apply

Objective: LO 13-4

26) What is the Barry Company's net increase in operating income as a result of the growth component?

- A) \$72,500 unfavourable
- B) \$72,500 favourable
- C) \$51,500 favourable
- D) \$99,500 unfavourable
- E) \$99,500 favourable

Answer: B

Explanation: B)  $\$80,000 \text{ (F)} + \$7,500 \text{ (U)} = \$72,500 \text{ (F)}$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 13-4

27) What is the Barry Company's revenue effect of price-recovery component?

- A) \$54,000 favourable
- B) \$162,000 favourable
- C) \$54,000 unfavourable
- D) \$92,000 favourable
- E) \$50,000 unfavourable

Answer: B

Explanation: B)  $(\$115 - \$100) \times 10,800 = \$162,000 \text{ (F)}$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-4

28) What is the Barry Company's cost effect of price-recovery component?

- A) \$61,000 favourable
- B) \$60,850 unfavourable
- C) \$60,100 favourable
- D) \$60,100 unfavourable
- E) \$61,000 unfavourable

Answer: E

Explanation: E)  $((\$16 - \$15) \times 32,400) + ((\$22 - \$20) \times 12,500) + ((\$3,120 - \$3,000) \times 30)$   
 $= \$32,400 + \$25,000 + \$3,600 = \$61,000 \text{ (U)}$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 13-4

29) What is the Barry Company's net increase in operating income as a result of the price-recovery component?

- A) \$101,000 unfavourable
- B) \$101,000 favourable
- C) \$6,100 favourable
- D) \$2,700 unfavourable
- E) \$6,100 unfavourable

Answer: A

Explanation: A)  $\$162,000 \text{ (F)} + \$61,000 \text{ (U)} = \$101,000 \text{ (U)}$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 13-4

30) What is the Barry Company's productivity component of change in operating income?

- A) \$31,620 favourable
- B) \$11,120 favourable
- C) \$11,120 unfavourable
- D) \$33,520 favourable
- E) \$33,520 unfavourable

Answer: B

Explanation: B)  $((31,900 - 32,400) \times \$16) + ((12,500 - 12,500) \times \$22) + ((29 - 30) \times \$3,120)$   
 $= (\$8,000) + \$0 + (\$3,120) = \$11,120 \text{ (F)}$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 13-4

31) \_\_\_\_\_ measures the reduction in costs attributable to a reduction in the quantity of inputs used in year two relative to the quantity of inputs that would have been used in year one to produce the year two output.

- A) The growth component
- B) The price-recovery component
- C) The productivity component
- D) The cost leadership component
- E) The strategy component

Answer: C

Diff: 1 Type: MC

Skill: Remember

Objective: LO 13-4

32) \_\_\_\_\_ measures the changes in operating income attributed solely to an increase in the quantity of output between years one and two.

- A) The growth component
- B) The price-recovery component
- C) The productivity component
- D) The cost leadership component
- E) The strategy component

Answer: A

Diff: 1 Type: MC

Skill: Remember

Objective: LO 13-4

33) \_\_\_\_\_ measures the change in operating income attributable solely to changes in a company's profit margins between years one and two.

- A) The growth component
- B) The price-recovery component
- C) The productivity component
- D) The cost leadership component
- E) The strategy component

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-4

34) Successful implementation of a cost leadership strategy will result in

- A) large favorable growth and price-recovery components.
- B) large favorable price-recovery and productivity components.
- C) large favorable productivity and growth components.
- D) only a large favorable growth component.
- E) a price-recovery component greater than a growth component.

Answer: C

Diff: 3 Type: MC

Skill: Understand

Objective: LO 13-4

35) Successful implementation of a product differentiation strategy will result in

- A) a large favorable growth and price-recovery components.
- B) a large favorable price-recovery and productivity components.
- C) a large favorable productivity and growth components.
- D) only a large favorable growth component.
- E) a price-recovery component greater than a growth component.

Answer: A

Diff: 3 Type: MC

Skill: Understand

Objective: LO 13-4

*Answer the following questions using the information below:*

Merrill Company makes a household appliance with model number X800. The goal for Year 2 is to reduce direct materials usage per unit. No defective units are currently produced. Manufacturing conversion costs depend on production capacity defined in terms of X800 units that can be produced. The industry market size for appliances increased 5% from Year 1 to Year 2. The following additional data are available for Years 1 and 2:

	<u><b>Year 1</b></u>	<u><b>Year 2</b></u>
Units of X800 produced and sold	10,000	10,500
Selling price	\$100	\$95
Direct materials (square metres)	30,000	29,000
Direct material costs per square metre	\$10	\$11
Manufacturing capacity for X800 (units)	12,500	12,000
Total conversion costs	\$250,000	\$240,000
Conversion costs per unit of capacity	\$20	\$20

36) What is the Merrill Company's revenue effect of the growth component?

- A) \$2,500 U
- B) \$52,500 U
- C) \$47,500 F
- D) \$50,000 F

Answer: D

Explanation: D)  $(10,500 - 10,000) \times \$100 = \$50,000$  F

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-4

37) What is the Merrill Company's cost effect of the growth component for direct materials?

- A) \$15,000 U
- B) \$10,000 U
- C) \$10,000 F
- D) \$16,500 F
- E) \$7,500 F

Answer: A

Explanation: A)  $30,000/10,000$  units = 3 sq metres per unit

$500$  additional units  $\times$  3sq metres = 1,500 additional square metres

$1,500$  additional sq metres  $\times$  \$10 per sq ft = \$15,000 U

OR

$30,000 \times 10,500/10,000 = 31,500$ ;  $(31,500 - 30,000) \times \$10 = \$15,000$  U

Diff: 3 Type: MC

Skill: Apply

Objective: LO 13-4

38) What is the Merrill Company's cost effect of the growth component for conversion costs?

A) \$12,500 U

B) \$0

C) \$10,000 U

D) \$10,000 F

E) \$12,500 F

Answer: D

Explanation: B)  $(12,500 - 12,000) \times \$20 = 10,000$  F

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-4

39) An analysis of Louis Brown Corporation's operating income changes between year 1 and year 2 show the following:

Operating income for Year 1	\$1,000,000
Add growth component	30,000
Add price-recovery component	200,000
Deduct productivity component	<u>(10,000)</u>
Operating income for Year 2	<u>\$1,220,000</u>

Required:

Is Louis Brown's operating income gain consistent with the product differentiation or cost leadership strategy? Explain briefly.

Answer: Louis Brown's operating income gain is consistent with the product differentiation strategy since the increase in operating income was driven by the \$200,000 gain in the price-recovery component. It appears that Brown's superior quality stimulated slight growth and allowed it to charge a price premium for its products.

Diff: 3 Type: ES

Skill: Understand

Objective: LO 13-4

40) An analysis of Gardner Corporation's operating income changes between Year 1 and Year 2 show the following:

Operating income for Year 1	\$1,000,000
Add growth component	50,000
Deduct price-recovery component	(30,000)
Add productivity component	<u>120,000</u>
Operating income for Year 2	<u>\$1,140,000</u>

Required:

Is Gardner's operating income gain consistent with the product differentiation or cost leadership strategy? Explain briefly.

Answer: Gardner's operating income gain is consistent with the cost leadership strategy because the increase in operating income was driven by the \$120,000 gain in productivity. It appears that Gardner took advantage of its productivity gain to reduce prices and to fuel growth.

Diff: 3 Type: ES

Skill: Understand

Objective: LO 13-4



Use the information below to answer the following question(s).

Following a strategy of product differentiation, Despotovich Corporation makes a high-end Computer Monitor, CM12. Despotovich Corporation presents the following data for the years 1 and 2:

	<u>Year 1</u>	<u>Year 2</u>
Units of CM12 produced and sold	5,000	5,500
Selling price	\$400	\$440
Direct materials (pounds)	15,000	15,375
Direct materials costs per kilogram	\$40	\$44
Manufacturing capacity for CM12 (units)	10,000	10,000
Total manufacturing conversion costs	\$500,000	\$550,000
Manufacturing conversion costs per unit of capacity	\$50	\$55
Selling and customer-service capacity (customers)	60	58
Total selling and customer-service costs	\$180,000	\$181,250
Cost per customer of selling & customer-service capacity	\$3,000	\$3,125

Despotovich Corporation produces no defective units but it wants to reduce direct materials usage per unit of CM12 in Year 2. Manufacturing conversion costs in each year depend on production capacity defined in terms of CM12 units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Neither conversion costs nor customer-service costs are affected by changes in actual volume. Despotovich Corporation has 46 customers in Year 1 and 50 customers in Year 2. The industry market size for high-end computer monitors increased 5% from Year 1 to Year 2. Of the \$40 increase in unit selling price, \$10 was attributable to a general increase in prices.

41) Required:

- What is the operating income for Year 1?
- What is the operating income in Year 2?
- What is the change in operating income from Year 1 to Year 2?

Answer:

- $(\$400 \times 5,000) - ((\$40 \times 15,000) + (\$50 \times 10,000) + (\$3,000 \times 60)) = \$720,000$
- $(\$440 \times 5,500) - ((\$44 \times 15,375) + (\$55 \times 10,000) + (\$3,125 \times 58)) = \$1,012,250$
- $\$1,012,250 - \$720,000 = \$292,250$  (F)

Diff: 2 Type: ES

Skill: Apply

Objective: LO 13-4

42) Required:

- a. What amount is the revenue effect of growth component?
- b. What amount is the cost effect of growth component?
- c. What is the change in operating income as a result of the growth component?

Answer:

- a.  $(5,500 - 5,000) \times \$400 = \$200,000$  (F)
- b.  $[(15,000/5,000) \times 5,500 - 15,000] \times \$40 + [(10,000 - 10,000) \times \$50] + ((60 - 60) \times \$3,000) = \$60,000$  (U)
- c.  $\$200,000$  (F) +  $\$60,000$  (U) =  $\$140,000$  (F)

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-4

43) Required:

- a. What amount is the revenue effect of price recovery component?
- b. What amount is the cost effect of price recovery component?
- c. What is the change in income as a result of the price recovery component?

Answer:

- a.  $(\$440 - \$400) \times 5,500 = \$220,000$  (F)
- b.  $((\$44 - \$40) \times 16,500) + ((\$55 - \$50) \times 10,000) + ((\$3,125 - \$3,000) \times 60) = \$66,000 + \$50,000 + \$7,500 = \$123,500$  (U)
- c.  $\$220,000$  (F) +  $\$123,500$  (U) =  $\$96,500$  (F)

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-4

44) Required:

What is the amount of the productivity component?

Answer:  $((15,375 - 16,500) \times \$44) + ((10,000 - 10,000) \times \$55) + ((58-60) \times \$3,125) = \$55,750$  (F)

Reconciliation:  $\$140,000$  (F) +  $\$96,500$  (F) +  $\$55,750$  (F) =  $\$292,250$  (F)

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-4

45) Required:

Present the following,

- a. The change in operating income from cost leadership.
- b. The change in operating income due to industry wide effects.
- c. The effect of product differentiation on operating income and a summarization of the change in operating income between Year 1 and Year 2.

Answer:

- a. Change in operating income from cost leadership:

Productivity component	\$55,750 (F)
Mgmt. directed price increase ( $\$30 \times 5,500$ )	165,000 (F)
Growth component mgmt. share ( $\$140,000 (F) \times (250/500)$ )	<u>70,000 (F)</u>
Total	\$290,750 (F)

- b. Change in operating income due to industry wide effects:

Growth in industry mkt. size ( $\$140,000 (F) \times (250/500)$ )	\$70,000 (F)
General price increase ( $\$10 \times 5,500$ )	<u>55,000 (F)</u>
Total	\$125,000 (F)

- c. Increase in mkt. prices of inputs (cost effect of price recovery \$123,500 (U))

Summarization of change in operating income:

$\$290,750 (F) + \$125,000 (F) + \$123,500 (U) = \$292,250 (F)$

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-4

Use the information below to answer the following question(s).

Following a strategy of product differentiation, Ernsting Ltd. makes high quality electronic components. Ernsting Ltd. presents the following data for the past two years relating to its XJ649 product.

	<u>Year 1</u>	<u>Year 2</u>
Units of XJ649 produced and sold	4,000	4,320
Selling price	\$800	\$850
Direct materials (kilograms)	10,400	12,360
Direct materials costs per kilogram	\$60	\$64
Manufacturing capacity for XJ649 (units)	15,000	15,000
Conversion costs	\$1,350,000	\$1,440,000
Conversion costs per unit of capacity	\$90	\$96
Selling and customer-service capacity (customers)	80	78
Total selling and customer-service costs	\$760,000	\$780,000
Selling and customer-service capacity cost per customer	\$9,500	\$10,000

Ernsting produces no defective units but it wants to reduce direct materials usage per unit in Year 2 . Manufacturing conversion costs in each year depend on production capacity defined in terms of units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Neither conversion costs nor customer-service costs are affected by changes in actual volume. Ernsting has 60 customers in Year 1 and 66 customers in Year 2. The industry market size for the product increased 6% from Year 1 to Year 2. Of the \$50 increase in unit selling price, \$30 is attributable to a general price increase.

46) Required:

- What is the operating income for Year 1?
- What is the operating income in Year 2?
- What is the change in operating income from Year 1 to Year 2?

Answer:

$$\text{a. } (\$800 \times 4,000) - [(\$60 \times 10,400) + (\$90 \times 15,000) + (\$9,500 \times 80)] = \\ \$3,200,000 - \$624,000 - \$1,350,000 - \$760,000 = \$466,000$$

$$\text{b. } (\$850 \times 4,320) - [(\$64 \times 12,360) + (\$96 \times 15,000) + (\$10,000 \times 78)] = \\ \$3,672,000 - \$1,440,000 - \$791,040 - \$780,000 = \$660,960$$

$$\text{c. } \$466,000 - \$660,960 = 194,960 \text{ (F)}$$

Diff: 2 Type: ES

Skill: Apply

Objective: LO 13-4

47) Required:

- a. What amount is the revenue effect of the growth component?
- b. What amount is the cost effect of the growth component?
- c. What is the net effect on operating income as a result of the growth component?

Answer:

- a.  $(4,320 - 4,000) \times \$800 = \$256,000$  (F)
- b.  $4,320 \times 10,400/4,000 = 11,232$ ;  
 $[11,232 - 10,400] \times \$60 + [(15,000 - 15,000) \times \$90] + [(80 - 80) \times \$6,000] = \$49,920$  (U)
- c.  $\$256,000$  F +  $\$49,920$  U = 206,080 (F)

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-4

48) Required:

- a. What amount is the revenue effect of the price-recovery component?
- b. What amount is the cost effect of the price-recovery component?
- c. What is the net effect on operating income as a result of the price-recovery component?
- d. What is the net effect on operating income as a result of the productivity component?

Answer:

- a.  $(\$850 - \$800) \times 4,320 = \$216,000$  (F)
- b.  $4,320 \times 10,400/4,000 = 11,232$ ;  
 $[(\$64 - \$60) \times 11,232] + [(\$96 - \$90) \times 15,000] + [\$10,000 - \$9,500] \times 80$   
 $= \$44,928 + \$90,000 + \$40,000 = \$174,928$ (U)
- c.  $\$216,000$  F +  $\$174,928$  U =  $\$41,072$  (F)
- d.  $4,320 \times 10,400/4,000 = 11,232$ ;  
 $[(12,360 - 11,232) \times \$64] + [(15,000 - 15,000) \times \$96] + [(78 - 80) \times \$10,000]$   
 $= \$72,192 + \$0 - \$20,000 = \$52,192$  (U)

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-4

49) Required:

Present the following,

- a. The change in operating income from cost leadership.
- b. The change in operating income due to industry wide effects.
- c. The effect of product differentiation on operating income and a summarization of the change in operating income between Year 1 to Year 2.

Answer:

- a. Change in operating income from cost leadership:

Productivity component	\$52,192 (U)
Mgmt. directed price increase ( $\$20 \times 4,320$ )	86,400 (F)
Growth component mgmt. share ( $\$206,080 (F) \times 80/320$ )	<u>51,520 (F)</u>
Total	\$85,728 (F)

- b. Change in operating income due to industry wide effects:

Growth in industry mkt. size ( $\$206,080 (F) \times (240/320)$ )	\$154,560(F)
General price increase ( $\$30 \times 4,320$ )	<u>129,600 (F)</u>
Total	\$284,160 (F)

- c. Increase in mkt. prices of inputs (cost effect of price recovery \$174,928 (U))

Summarization of change in operating income:

$\$85,728 (F) + \$284,160 (F) + \$174,928 (U) = \$194,960 (F)$

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-4

Use the information below to answer the following question(s).

Following a strategy of product differentiation, Instruments Inc. makes a hand held calculator, II400. Instruments Inc. presents the following data for the years 1 and 2:

	<u>Year 1</u>	<u>Year 2</u>
Units of II400 produced and sold	50,000	52,500
Selling price	\$40	\$44
Direct materials (kilograms)	150,000	153,375
Direct materials costs per kilogram	\$4.00	\$4.40
Manufacturing capacity for II400 (units)	62,500	62,500
Total manufacturing conversion costs	\$500,000	\$550,000
Manufacturing conversion costs per unit of capacity	\$8.00	\$8.80
Selling and customer-service capacity (customers)	30	29
Total selling and customer-service costs	\$360,000	\$362,500
Cost per customer of selling & customer-service capacity	\$12,000	\$12,500

Instruments Inc. produces no defective units but it wants to reduce direct materials usage per unit of II400 in year 2. Manufacturing conversion costs in each year depend on production capacity defined in terms of II400 units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Neither conversion costs or customer-service costs are affected by changes in actual volume. Instruments Inc. has 23 customers in year 1 and 25 customers in year 2. The industry market size for hand held calculators increased 5% from year 1 to year 2. Of the \$4 increase in unit selling price, \$1 is due to a general increase in prices.

50) Required:

- What is the operating income for Year 1?
- What is the operating income in Year 2?
- What is the change in operating income from Year 1 to Year 2?

Answer:

$$\begin{aligned} \text{a. } & (\$40 \times 50,000) - (\$4 \times 150,000) - (\$8 \times 62,500) - (\$12,000 \times 30) = \$2,000,000 - \$600,000 - \$500,000 - \$360,000 \\ & = \$540,000 \end{aligned}$$

$$\begin{aligned} \text{b. } & (\$44 \times 52,500) - (\$4.40 \times 153,375) - (\$8.80 \times 62,500) - (\$12,500 \times 29) \\ & = \$2,310,000 - \$674,850 - \$550,000 - \$362,500 = \$722,650 \end{aligned}$$

$$\text{c. } \$722,650 - \$540,000 = \$182,650$$

Diff: 2 Type: ES

Skill: Apply

Objective: LO 13-4

51) Required:

- a. What amount is the revenue effect of the growth component?
- b. What amount is the cost effect of the growth component?
- c. What is the net effect on operating income as a result of the growth component?

Answer:

- a.  $(52,500 - 50,000) \times \$40 = \$100,000 \text{ F}$
- b.  $(52,500 \times 150,000 / 50,000) = 157,500$   
 $[(157,500 - 150,000) \times \$4] + [(62,500 - 62,500) \times \$8] + [(30 - 30) \times \$12,000] = \$30,000 \text{ U}$
- c.  $\$100,000 \text{ F} + \$30,000 \text{ U} = \$70,000 \text{ F}$

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-4

52) Required:

- a. What amount is the revenue effect of the price-recovery component?
- b. What amount is the cost effect of the price-recovery component?
- c. What is the net change in operating income as a result of the price-recovery component?

Answer:

- a.  $(\$44 - \$40) \times 52,500 = \$210,000 \text{ (F)}$
- b.  $((\$4.40 - \$4.00) \times ((150,000 / 50,000) \times 52,500)) + ((\$8.80 - \$8.00) \times 62,500)$   
 $+ ((\$12,500 - \$12,000) \times 30) = \$128,000 \text{ (U)}$
- c.  $\$210,000 \text{ (F)} + \$128,000 \text{ (U)} = \$82,000 \text{ (F)}$

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-4

53) Required:

- a. What is the net effect on operating income as a result of the productivity component?

Answer:

- a.  $52,500 \times 150,000 / 50,000 = 157,500$ ;  
 $[(153,375 - 157,500) \times \$4.4] + [(62,500 - 62,500) \times \$8.80] + [(29 - 30) \times \$12,500]$   
 $= (\$18,150) + \$0 + (\$12,500) = \$30,650 \text{ F}$

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-4



54) Required:

Present the following,

- a. The change in operating income from cost leadership.
- b. The change in operating income due to industry wide effects.
- c. The effect of product differentiation on operating income and a summarization of the change in operating income between Year 1 to Year 2.

Answer:

- a. Change in operating income from cost leadership:

Productivity component	\$30,650 (F)
Mgmt. directed price increase ( $\$3 \times 52,500$ )	157,500 (F)
Growth component mgmt. share ( $\$70,000 (F) \times 0/2,500$ )	<u>0 (F)</u>
Total	\$188,150 (F)

- b. Change in operating income due to industry wide effects:

Growth in industry mkt. size ( $\$70,000(F) \times (2,500/2,500)$ )	\$70,000(F)
General price increase ( $\$1 \times 52,500$ )	<u>52,500 (F)</u>
Total	\$122,500 (F)

- c. Increase in mkt. prices of inputs (cost effect of price recovery)      \$128,000 (U)

Summarization of change in operating income:

$\$188,150 (F) + \$122,500(F) + \$128,000 (U) = \$182,650 (F)$

Diff: 3    Type: ES

Skill: Apply

Objective: LO 13-4

Use the information below to answer the following question(s).

Following a strategy of product differentiation, Electronics Inc. makes a hand held calculator, II300. Electronics Inc. presents the following data for the years 1 and 2:

	<u>Year 1</u>	<u>Year 2</u>
Units of II300 produced and sold	50,000	55,000
Selling price	\$40	\$46
Direct materials (kilograms)	150,000	151,625
Direct materials costs per kilogram	\$6.00	\$6.50
Manufacturing capacity for II300 (units)	70,000	70,000
Total manufacturing conversion costs	\$560,000	\$630,000
Manufacturing conversion costs per unit of capacity	\$8.00	\$9.00
Selling and customer-service capacity (customers)	33	31
Total selling and customer-service costs	\$297,000	\$294,500
Cost per customer of selling & customer-service capacity	\$9,000	\$9,500

Electronics Inc. produces no defective units but it wants to reduce direct materials usage per unit of II300 in year 2. Manufacturing conversion costs in each year depend on production capacity defined in terms of II300 units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Neither conversion costs or customer-service costs are affected by changes in actual volume. Electronics Inc. has 23 customers in year 1 and 25 customers in year 2. The industry market size for hand held calculators increased 5% from year 1 to year 2. Of the \$6 increase in unit selling price, \$2 is due to a general increase in prices.

55) Required:

- What is the operating income for Year 1?
- What is the operating income in Year 2?
- What is the change in operating income from Year 1 to Year 2?

Answer:

$$\text{a. } (\$40 * 50,000) - (\$6 * 150,000) - (\$8 * 70,000) - (\$9,000 * 33) = \$2,000,000 - \$900,000 - \$560,000 - \$297,000 = \$243,000$$

$$\text{b. } (\$46 * 55,000) - (\$6.50 * \$151,625) - (\$9.00 * 70,000) - (\$9,500 * 31) \\ = \$2,530,000 - \$985,564 - 630,000 - \$294,500 = \$619,938$$

$$\text{c. } \$619,938 - \$243,000 = \$376,938$$

Diff: 2 Type: ES

Skill: Apply

Objective: LO 13-4

56) Required:

- a. What amount is the revenue effect of the growth component?
- b. What amount is the cost effect of the growth component?
- c. What is the net effect on operating income as a result of the growth component?

Answer:

- a.  $(55,000 - 50,000) \times \$40 = \$200,000$  F
- b.  $(55,000 \times 150,000 / 50,000) = 165,000$   
 $[(165,000 - 150,000) \times \$6] + [70,000 - 70,000] \times \$8 + [(33 - 33) \times \$9,000] = \$90,000$  U
- c.  $\$200,000$  F +  $\$90,000$  U =  $\$110,000$  F

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-4

57) Required:

- a. What amount is the revenue effect of the price-recovery component?
- b. What amount is the cost effect of the price-recovery component?
- c. What is the net change in operating income as a result of the price-recovery component?

Answer:

- a.  $(\$46 - \$40) \times 55,000 = \$330,000$  (F)
- b.  $((\$6.50 - \$6.00) \times ((150,000 / 50,000) \times 55,000)) + ((\$9.00 - \$8.00) \times 70,000)$   
 $+ ((\$9,500 - \$9,000) \times 33) = \$82,500 + \$70,000 + \$16,500 = \$169,000$  (U)
- c.  $\$330,000$  (F) +  $\$169,000$  (U) =  $\$161,000$  F

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-4

58) Required:

- a. What is the net effect on operating income as a result of the productivity component?

Answer:

- a.  $55,000 \times 150,000 / 50,000 = 165,000$ ;  
 $[(151,625 - 165,000) \times \$6.50] + [70,000 - 70,000] \times \$9.00 + [(31 - 33) \times \$9,500]$   
 $= (\$18,150) + \$0 + (\$12,500) = (\$86,938) + \$0 + (\$19,000) = \$105,938$  F

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-4

59) Required:

Present the following,

- a. The change in operating income from cost leadership.
- b. The change in operating income due to industry wide effects.
- c. The effect of product differentiation on operating income and a summarization of the change in operating income between Year 1 to Year 2.

Answer:

- a. Change in operating income from cost leadership:

Productivity component	\$105,938 ( F)
Mgmt. directed price increase ( $\$4 \times 55,000$ )	220,000 (F)
Growth component mgmt. share ( $\$110,000 (F) \times 2,500/5,000$ )	<u>55,000 (F)</u>
Total	\$380,938 (F)

- b. Change in operating income due to industry wide effects:

Growth in industry mkt. size ( $\$110,000(F) \times (2,500/5,000)$ )	\$55,000(F)
General price increase ( $\$2 \times 55,000$ )	<u>110,000 (F)</u>
Total	\$165,000 (F)

- c. Increase in mkt. prices of inputs (cost effect of price recovery)      \$169,000 (U)

Summarization of change in operating income:

$\$380,938 (F) + \$165,000(F) + \$169,000 (U) = 376,938 (F)$

Diff: 3    Type: ES

Skill: Apply

Objective: LO 13-4

60) Describe three key components in doing a strategic analysis of operating income.

Answer: The three key components in doing a strategic analysis of operating income include:

- a. the growth component, which measures the change in operating income attributable solely to an increase in the quantity of output sold from one year to the next.
- b. the price-recovery component, which measures the change in operating income attributable solely to changes in the prices of the inputs and the outputs from one year to the next.
- c. the productivity component, which measures the change in costs attributable to a change in the quantity of inputs used in the current year relative to the quantity of inputs that would have been used in the previous year to produce current year output.

Diff: 2    Type: ES

Skill: Understand

Objective: LO 13-4

13.5 Analyze the results from specific productivity and capacity control strategies to achieve BSC expectations.

1) Engineered costs result specifically from a clear cause-and-effect relationship between output and the resources needed to produce that output.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-5

2) Discretionary costs arise from periodic (usually yearly) decisions regarding the maximum amount to be incurred.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-5

3) Uncertainty refers to the possibility that an actual amount will be equal to an expected amount.

Answer: FALSE

Explanation: Uncertainty refers to the possibility that an actual amount will **deviate from** an expected amount.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-5

4) Downsizing is also called rightsizing.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-5

5) Downsizing is an integrated approach to configure processes, products, and people to by match costs to the activities that need to be performed, to operate efficiently and effectively, now and in the future.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-5

6) Productivity measures the relationship between actual inputs used (both quantities and costs) and standard outputs produced.

Answer: FALSE

Explanation: Productivity measures the relationship between actual inputs used (both quantities and costs) and **actual** outputs produced.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-5

7) Partial productivity equals quantity of output produced divided by quantity of individual input used.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-5

8) Total factor productivity (TFP) is the ratio of the quantity of output produced to the costs of all inputs used, where the inputs are combined on the basis of current period prices.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-5

9) Although total factor productivity (TFP) measures are comprehensive, operations personnel find financial TFP measures more difficult to understand and less useful than physical partial productivity measures in performing their tasks.

Answer: TRUE

Diff: 1 Type: TF

Skill: Understand

Objective: LO 13-5

10) Research and development cost is an example of an engineered cost.

Answer: FALSE

Explanation: Research and development cost is an example of a discretionary cost.

Diff: 2 Type: TF

Skill: Understand

Objective: LO 13-5

11) One way to eliminate unused capacity is to downsize.

Answer: TRUE

Diff: 1 Type: TF

Skill: Understand

Objective: LO 13-5

12) Downsizing often means eliminating jobs, which can have an adverse effect on employee morale.

Answer: TRUE

Diff: 2 Type: TF

Skill: Understand

Objective: LO 13-5

13) Engineered costs differ from discretionary costs by the two key dimensions of: 1) type of process; and, 2) the level of uncertainty.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-5

14) Infrastructure costs are generally variable in nature.

Answer: FALSE

Explanation: These costs are general fixed costs because they are committed to and acquired before they are used to full capacity.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 13-5

15) Which of the following BEST describes the effect of uncertainty?

A) The higher the level of uncertainty about the relationship between resources used and outputs, the less likely a cause-and-effect relationship will exist.

B) The higher the level of uncertainty about the relationship between resources used and outputs, the more likely a cause-and-effect relationship will exist.

C) The higher the level of uncertainty about the relationship between resources used and outputs, the more likely the cost will classified as a discretionary cost.

D) The higher the level of uncertainty about the relationship between resources used and outputs, the less likely the cost will classified as a discretionary cost.

E) The higher the level of uncertainty about the relationship between resources used and outputs, the less likely a cause-and-effect relationship will exist, and the more likely the cost will classified as a discretionary cost.

Answer: E

Diff: 2 Type: MC

Skill: Remember

Objective: LO 13-5

16) Unused capacity is difficult to determine for

A) engineered costs.

B) discretionary costs.

C) both engineered and discretionary costs.

D) costs with an observable cause and effect relationship.

E) costs that do not deviate from expected amounts.

Answer: B

Diff: 2 Type: MC

Skill: Remember

Objective: LO 13-5

17) The lower the inputs for a given set of outputs or the higher the outputs for a given set of inputs, the higher the level of

A) standard costs.

B) sales.

C) productivity.

D) labour costs.

E) labour costs and productivity.

Answer: C

Diff: 1 Type: MC

Skill: Remember

Objective: LO 13-5

18) Partial productivity multiplied by the quantity of input used results in

- A) expected production.
- B) budgeted output.
- C) quantity of output produced.
- D) a ratio.
- E) productivity.

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-5

19) \_\_\_\_\_ measures the relationship between actual inputs used and actual outputs achieved.

- A) Total factor productivity
- B) Partial productivity
- C) Productivity
- D) Product yield variance
- E) Labour yield

Answer: C

Diff: 1 Type: MC

Skill: Remember

Objective: LO 13-5

20) The ratio of the quantity of output produced divided by the quantity of a single input used, is called

- A) total factor productivity.
- B) partial productivity.
- C) productivity.
- D) product yield variance.
- E) productivity variance.

Answer: B

Diff: 1 Type: MC

Skill: Remember

Objective: LO 13-5



21) Melik Company provided the following information:

Budgeted input	12,000 kilograms
Actual input	15,000 litres
Budgeted production	5,000 units
Actual production	4,750 units

What is the partial productivity ratio?

- A) 0.32 units per kilogram
- B) 0.42 units per kilogram
- C) 2.40 units per kilogram
- D) 3.16 units per kilogram
- E) 0.80 units per kilogram

Answer: A

Explanation: A)  $PP = 4,750/15,000 = 0.32$  units per kilogram

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-5

22) Which of the following statements is TRUE concerning productivity?

- A) The lower the partial productivity ratio, the greater the productivity.
- B) Productivity has increased when the partial productivity ratio is high.
- C) Prices of inputs are incorporated in the partial productivity ratio.
- D) The partial productivity ratio measures the number of outputs produced per multiple input.
- E) The partial productivity ratio measures the amount of a single output produced with multiple inputs.

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-5

23) What is the direct manufacturing labour partial productivity, assuming 20,000 units were produced during the year and 80,000 direct manufacturing labour-hours were used?

- A) 0.25 unit per direct manufacturing labour-hour
- B) 0.50 unit per direct manufacturing labour-hour
- C) 0.75 unit per direct manufacturing labour-hour
- D) 4.00 unit per direct manufacturing labour-hour
- E) 1.25 unit per direct manufacturing labour-hour

Answer: A

Explanation: A)  $20,000/80,000 = 0.25$

Diff: 1 Type: MC

Skill: Apply

Objective: LO 13-5

24) What is the direct manufacturing labour partial productivity, assuming 10,000 units were produced during the year and 40,000 direct manufacturing labour-hours were used?

- A) 0.25 unit per direct manufacturing labour-hour
- B) 0.50 unit per direct manufacturing labour-hour
- C) 0.75 unit per direct manufacturing labour-hour
- D) 4.00 unit per direct manufacturing labour-hour
- E) 1.25 unit per direct manufacturing labour-hour

Answer: A

Explanation: A)  $10,000/40,000 = 0.25$

Diff: 1 Type: MC

Skill: Apply

Objective: LO 13-5

25) Which of the following statements is TRUE concerning productivity measures?

- A) Both the partial productivity and total factor productivity measures have the same weaknesses, but each has different strengths as a measure.
- B) Both the partial productivity and total factor productivity measures have the same strengths, but each has different weaknesses as a measure.
- C) Both the partial productivity and total factor productivity measures have the same strengths, and the same weaknesses as a measure.
- D) The weaknesses of the partial productivity measure are the strengths of the total factor productivity measure.
- E) The strengths and weakness in the measurements of the partial productivity measure are the strengths of the total factor productivity measures are completely unrelated to each other.

Answer: D

Diff: 2 Type: MC

Skill: Remember

Objective: LO 13-5

26) Which of the following would result in an increase in total factor productivity, assuming all other variables are held constant?

- A) The quantity of outputs increases.
- B) The company uses more total inputs.
- C) The company uses lower quality inputs.
- D) Current technology becomes obsolete.
- E) Quantity of inputs increases and costs of inputs stays the same.

Answer: A

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-5

27) Which of the following is a major advantage of total factor productivity?

- A) It measures the combined productivity of all inputs.
- B) The control operations personnel have over inputs.
- C) The control operations personnel have over outputs.
- D) The marketing mix determined by management.
- E) It is easy for operations personnel to understand.

Answer: A

Diff: 2 Type: MC

Skill: Remember

Objective: LO 13-5

28) \_\_\_\_\_ is the ratio of the quantity of output produced to the costs of all inputs used, where the inputs are combined on the basis of current period prices.

- A) Total factor productivity
- B) Partial productivity
- C) Productivity
- D) Product yield variance
- E) Manufacturing conversion

Answer: A

Diff: 1 Type: MC

Skill: Remember

Objective: LO 13-5

29) A disadvantage of total factor productivity over partial productivity is that

- A) it focuses attention on a single input.
- B) it compares multiple physical inputs with outputs.
- C) the input is a fixed amount.
- D) operations personnel find financial measures more difficult to understand than physical measures.
- E) cause and effect relationships are more easily identified.

Answer: D

Diff: 2 Type: MC

Skill: Remember

Objective: LO 13-5

30) Which of the following statements about productivity measures is TRUE?

- A) They may only be stated in terms of dollars.
- B) Total factor productivity explicitly considers gains from using fewer inputs, not from substituting inputs.
- C) Partial productivity measures allow managers to evaluate the effect of input substitutions on overall productivity.
- D) It is important to use the results as a starting point for analysis.
- E) The productivity measure may not be made for companies with multiple products.

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-5

- 31) The average number of student credit hours taught per faculty member is an example of
- A) an expected performance measure.
  - B) a budgeted productivity measure.
  - C) a standard productivity measure.
  - D) a partial productivity measure.
  - E) a total factor productivity measure.

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 13-5

- 32) Frazier Company provided the following information:

Budgeted input	19,500 litres
Actual input	17,900 litres
Budgeted production	20,000 units
Actual production	19,000 units

What is the partial productivity ratio?

- A) 0.94 unit per litre
- B) 1.03 units per litre
- C) 1.06 units per litre
- D) 0.98 units per litre
- E) 1.09 units per litre

Answer: C

Explanation: C)  $PP = 19,000/17,900 = 1.06$  units per litre

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-5

- 33) Germaine Company provided the following information.

Budgeted input	9,750 litres
Actual input	8,950 litres
Budgeted production	10,000 units
Actual production	9,500 units

What is the partial productivity ratio?

- A) 0.97 unit per litre
- B) 1.02 units per litre
- C) 1.06 units per litre
- D) 1.12 units per litre
- E) 1.71 units per litre

Answer: C

Explanation: C)  $PP = 9,500/8,950 = 1.06$  units per litre

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-5

34) Vinetta Ltd. provided the following information:

Budgeted input	18,000 litres
Actual input	17,200 litres
Budgeted production	32,000 units
Actual production	30,000 units

What is the partial productivity ratio?

- A) 1.78 unit per litre
- B) 1.74 units per litre
- C) 0.57 units per litre
- D) 0.56 units per litre
- E) 1.67 units per litre

Answer: B

Explanation: B)  $PP = 30,000/17,200 = 1.74$  units per litre

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-5

35) Justine Ltd. provided the following information.

Budgeted input	173,600 kilograms
Actual input	180,000 kilograms
Budgeted production	125,000 units
Actual production	135,000 units

What is the partial productivity ratio?

- A) 0.72 unit per kilogram
- B) 0.75 units per kilogram
- C) 1.34 units per kilogram
- D) 1.12 units per kilogram
- E) 0.78 units per kilogram

Answer: B

Explanation: B)  $PP = 135,000/180,000 = 0.75$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-5

36) Westcoast Ltd. provided the following information:

Material input quantity - plastic	173,600 kilograms
Material input cost - plastic	\$ 57,288
Material input quantity - paint	790 kilograms
Material input cost - paint	\$ 7,200
Units produced	115,700 units
Fully absorbed cost per unit	\$2.00
Selling price per unit	\$2.25

What is the total factor productivity ratio?

A) 1.8:1 fully absorbed cost to material input costs

B) 4:1 selling price to input cost

C) 220:1 input cost (plastic kg.:paint kg.)

D) 0.66 units per kilogram of input materials

E) \$1.79 units per dollar of input cost

Answer: E

Explanation: E)  $TFP = 115,700 / (\$57,288 + \$7,200) = \$1.79$  units per dollar of input cost

Diff: 2 Type: MC

Skill: Apply

Objective: LO 13-5

37) Power Company has been unhappy with the financial accounting variances that its cost accounting system has been producing, because its managers believe that there is more to evaluating an operation than just examining accounting numbers. Therefore, it has started gathering data to assist in the examination of nonfinancial results of operations. The following information relates to the manufacture of remote control units for televisions, radios, and stereo components.

	<u>Year 1</u>	<u>Year 2</u>
Remote control units produced and sold	40,000	50,000
Direct manufacture labour-hours	6,000	6,600
Direct materials used (sets)	40,300	50,250
Direct manufacture cost per hour	\$18	\$20
Direct materials cost per set	\$31	\$32

Required:

- What is the partial productivity of direct materials for each year?
- What is the partial productivity of direct manufacturing labour for each year?
- Did each area improve between year 1 and year 2? Explain.
- What will be the projected direct material and labour needs for year 3 if remote control units increase by 6,000 units, assuming Power Company applies the constant returns to scale technology?

Answer:

- Year 1 Partial prod. d. m. =  $40,000/40,300 = 0.993$

Year 2 Partial prod. d. m. =  $50,000/50,250 = 0.995$
- Year 1 Partial prod. d. m. l. =  $40,000/6,000 = 6.67$

Year 2 Partial prod. d. m. l. =  $50,000/6,600 = 7.58$
- Yes, both areas showed improvement because the ratios went up.
- Production increase =  $6,000/50,000 = 12$  percent

Projected direct material sets =  $50,250 \times 1.12 = 56,280$  sets

Projected direct mfg. labour =  $6,600 \times 1.12 = 7,392$  hours

Diff: 2 Type: ES

Skill: Apply

Objective: LO 13-5

38) Electronics Inc. has been unhappy with the financial accounting variances that its cost accounting system has been producing, because its managers believe that there is more to evaluating an operation than just examining accounting numbers. Therefore, it has started gathering data to assist in the examination of nonfinancial results of operations. The following information relates to the manufacturing of remote control units for televisions, radios, and stereo components:

	<u>Year 1</u>	<u>Year 2</u>
Remote control units produced and sold	20,000	24,000
Direct manufacture labour-hours	3,000	3,200
Direct materials used (sets)	20,200	26,200
Direct manufacture cost per hour	\$36	\$40
Direct materials cost per set	\$62	\$64

Required:

- What is the partial productivity of direct materials for each year?
- What is the partial productivity of direct manufacturing labour for each year?
- Did each area improve between year 1 and year 2? Explain.
- What will be the projected direct material and labour needs for year 3 if remote control units increase by 3,000 units, assuming Electronics, Inc. applies the constant returns to scale technology?

Answer:

- $\text{Year 1 Partial prod. d. m.} = 20,000/20,200 = 0.990$   
 $\text{Year 2 Partial prod. d. m.} = 24,000/26,200 = 0.916$
- $\text{Year 1 Partial prod. d. m. l.} = 20,000/3,000 = 6.67$   
 $\text{Year 2 Partial prod. d. m. l.} = 24,000/3,200 = 7.50$
- No, materials went down, while labour improved.
- $\text{Production increase} = 3,000/24,000 = 12.5 \text{ percent}$   
 $\text{Projected direct material sets} = 26,200 \times 1.125 = 29,475 \text{ sets}$   
 $\text{Projected direct mfg. labour} = 3,200 \times 1.125 = 3,600 \text{ hours}$

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-5



39) Grader Company manufactures road graders. Because its managers all have engineering backgrounds, it prefers nonfinancial information for its decision-making models. Therefore, it requires that the accountants gather data to assist in the examination of nonfinancial results of operations. The following information relates to the manufacture of a mobile paver:

	<u>Year 1</u>	<u>Year 2</u>
Units produced and sold	3,400	2,800
Direct manufacture labour-hours	68,000	57,600
Direct materials used (tonnes)	14,500	12,200
Direct manufacture cost per hour	\$21	\$22
Direct materials cost per tonne	\$431	\$443

Required:

- What is the partial productivity for direct materials for each year?
- What is the partial productivity for direct manufacturing labour for each year?
- What is the total factor productivity for each year?

Answer:

- Year 1      Partial prod. d. m. =  $3,400/14,500 = 0.234$

Year 2      Partial prod. d. m. =  $2,800/12,200 = 0.230$

- Year 1      Partial prod. d. m. l. =  $3,400/68,000 = 0.050$

Year 2      Partial prod. d. m. l. =  $2,800/57,600 = 0.049$

- Year 1      Direct materials =  $14,500 \times \$431 = \$6,249,500$

                Direct mfg. labour =  $68,000 \times \$21 = 1,428,000$

                Total      \$7,677,500

Year 2      Direct materials =  $12,200 \times \$443 = \$5,404,600$

                Direct mfg. Labour =  $57,600 \times \$22 = 1,267,200$

                Total      \$6,671,800

Year 1      Total factor prod. =  $3,400/\$7,677,500 = 0.00044$

Year 2      Total factor prod. =  $2,800/\$6,671,800 = 0.00042$

Diff: 3    Type: ES

Skill: Apply

Objective: LO 13-5

40) Lake Company manufactures small boats. Because its managers all have engineering backgrounds, they prefer nonfinancial information for their decision-making models. Therefore, they require the accountants gather data to assist in the examination of nonfinancial results of operations. The following information relates to the manufacture of a small boat.

	<u>Year 1</u>	<u>Year 2</u>
Units produced and sold	1,700	1,500
Direct manufacture labour-hours	35,000	32,000
Direct materials used (tonnes)	7,000	6,400
Direct manufacture cost per hour	\$42	\$44
Direct materials cost per tonne	\$700	\$720

Required:

- What is the partial productivity for direct materials for each year?
- What is the partial productivity for direct manufacturing labour for each year?
- What is the total factor productivity for each year?

Answer:

- Year 1      Partial prod. d. m. =  $1,700/7,000 = 0.243$

Year 2      Partial prod. d. m. =  $1,500/6,400 = 0.234$
- Year 1      Partial prod. d. m. l. =  $1,700/35,000 = 0.049$

Year 2      Partial prod. d. m. l. =  $1,500/32,000 = 0.047$
- Year 1      Direct materials =  $7,000 \times \$700 = \$4,900,000$

                 Direct mfg. labour =  $35,000 \times \$42 = 1,470,000$

                 Total      \$6,370,000

Year 2      Direct materials =  $6,400 \times \$720 = \$4,608,000$

                 Direct mfg. Labour =  $32,000 \times \$44 = 1,408,000$

                 Total      \$6,016,000

Year 1      Total factor prod. =  $1,700/\$6,370,000 = 0.00027$

Year 2      Total factor prod. =  $1,500/\$6,016,000 = 0.00025$

Diff: 3    Type: ES

Skill: Apply

Objective: LO 13-5

41) Distance Company has been unhappy with the financial accounting variances that its cost accounting system has been producing, because its managers believe that there is more to evaluating an operation than just examining accounting numbers. Therefore, it has started gathering data to assist in the examination of nonfinancial results of operations. The following information relates to the manufacture of remote control units for televisions, radios, and stereo components:

	<u>Year 1</u>	<u>Year 2</u>
Remote control units produced and sold	80,000	100,000
Direct manufacture labour-hours	12,000	13,200
Direct materials used (sets)	80,600	100,500
Direct manufacture cost per hour	\$18	\$20
Direct materials cost per set	\$31	\$32

**Required:**

- What is the partial productivity of direct materials for each year?
- What is the partial productivity of direct manufacturing labour for each year?
- Did each area improve between Year 1 and Year 2? Explain.
- What will be the projected direct material and labour needs for Year 3 if remote control units increase by 12,000 units, assuming Distance Company applies the constant returns to scale technology?

Answer:

- $\text{Year 1 Partial productivity of direct materials} = 80,000/80,600 = 0.993$   
 $\text{Year 2 Partial productivity of direct materials} = 100,000/100,500 = 0.995$
- $\text{Year 1 Partial productivity direct manufacturing labour} = 80,000/12,000 = 6.67$   
 $\text{Year 2 Partial productivity direct manufacturing labour} = 100,000/13,200 = 7.58$
- Yes, both areas showed improvement because the ratios went up.
- $\text{Production increase} = 12,000/100,000 = 12 \text{ percent}$   
 $\text{Projected direct material sets} = 100,500 \times 1.12 = 112,560 \text{ sets}$   
 $\text{Projected direct manufacturing labour} = 13,200 \times 1.12 = 14,784 \text{ hours}$

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-5

42) Following a strategy of product differentiation, Sting Corporation makes a high-end computer monitor, CM7. Sting Corporation presents the following data for the years 2015 and 2016:

	<u>2015</u>	<u>2016</u>
Units of CM 7 produced and sold	5,000	5,500
Selling price	\$490	\$495
Direct materials (kilograms)	20,000	19,460
Direct materials costs per kilogram	\$30	\$34
Manufacturing capacity for CM7 (units)	10,000	8,000
Conversion costs	\$1,000,000	\$840,000
Conversion costs per unit of capacity	\$100	\$105
Selling and customer-service capacity (customers)	60	56
Total selling and customer-service costs	\$360,000	\$344,400
Selling and customer-service capacity cost per customer	\$6,000	\$6,150

Sting Corporation wants to reduce direct materials usage per unit of CM7 in 2016. Manufacturing conversion costs in each year depend on production capacity defined in terms of CM7 units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Sting Corporation has 100 customers in 2015 and 115 customers in 2016. The industry market size for high-end computer monitors increased 5% from 2015 to 2016.

Required:

- Calculate the effect on the change of operating income as a result of the productivity component.
- What is the partial productivity ratio for the direct materials for each year? (round to 4 decimal places) Give a plausible underlying reason for what may have caused the ratio to change.
- What is the total factor productivity for 2016 and the total factor productivity benchmark based on input costs that would have been used in 2015 to produce 2016 output?(round to 4 decimal places)
- Provide two key success factors, and a corresponding measure for each, that relate to Sting Corporation's internal business process balanced scorecard perspective.

Answer:

a.  $20,000 \times (5,500/5,000) = 22,000; (19,460 - 22,000) \times \$34 + [8,000 - 10,000] \times \$105 + [56 - 60] \times \$6,150$   
= \$ 320,960 F

b. PP 2015 =  $5,000 \text{ units}/20,000 \text{ kg.} = 0.2500$   
PP 2016 =  $5,500 \text{ units}/19,460 \text{ kg.} = 0.2826$

Possible underlying reasons include: better quality materials resulting in fewer defects; improved quality control, and so forth.

c. TFP 2016 =  $5,500 \text{ units}/[(19,460 \text{ kg.} \times \$34) + (8,000 \text{ units} \times \$105) + (56 \text{ customers} \times \$6,150)]$   
= 0.0030

TFP benchmark =  $5,500 \text{ units}/[(22,000 \text{ kg.} \times \$34) + (10,000 \text{ units} \times \$105) + (60 \text{ customers} \times \$6,150)]$   
= 0.0025

d. KSF (measures) include: quality (defect rates), productivity (yield), on time delivery of inputs (time lost to stockouts), and so forth.

Diff: 3 Type: ES

Skill: Analyze

Objective: LO 13-3, 4, 5

43) Fairytale Weddings manufactures wedding dresses. The following information relates to the manufacture of gowns in its Perth plant:

	<u>Year 1</u>	<u>Year 2</u>
Units produced and sold	43,000	52,600
Direct manufacture labour-hours	22,000	26,000
Direct materials used (metres)	130,000	152,000
Direct manufacture labour cost per hour	\$16	\$17
Direct materials cost per metre	\$10	\$11

Required:

Prepare an analysis of change in annual costs from year 1 to year 2 including direct materials, direct manufacturing labour, and total inputs.

Answer: Direct materials:

Actual Year 1 costs: $130,000 \times \$10 =$	\$1,300,000
Year 1 input for year 2 output: $130,000 \times 52,600/43,000 \times \$10 =$	<u>1,590,233</u>
Output adjustment	<u>\$290,233</u> U
Year 1 input for Year 2 output: =	\$1,590,233
Year 1 input with Year 2 costs: $130,000 \times 52,600/43,000 \times \$11 =$	<u>1,749,256</u>
Input price change	<u>\$159,023</u> U
Year 1 input with Year 2 costs: =	\$1,749,256
Year 2 costs: $152,000 \times \$11 =$	<u>1,672,000</u>
Productivity change	<u>\$77,256</u> F

Direct manufacturing labour:

Actual Year 1 costs: $22,000 \times \$16 =$	\$352,000
Year 1 input for Year 2 output: $22,000 \times 52,600/43,000 \times \$16 =$	<u>430,586</u>
Output adjustment	<u>\$78,586</u> U
Year 1 input for Year 2 output: =	\$430,586
Year 1 input with Year 2 costs: $22,000 \times 52,600/43,000 \times \$17 =$	<u>457,498</u>
Input price change	<u>\$26,912</u> U
Year 1 input with Year 2 costs: =	\$457,498
Year 2 costs: $26,000 \times \$17 =$	<u>442,000</u>
Productivity change	<u>\$15,498</u> F

All inputs:

Output adjustment: $\$290,233 \text{ U} + \$78,586 \text{ U} =$	\$368,819 U
Input price change: $\$159,023 \text{ U} + \$26,912 \text{ U} =$	\$185,935 U
Productivity change: $\$77,256 \text{ F} + \$15,498 \text{ F} =$	\$92,754 F

Diff: 3 Type: ES

Skill: Apply

Objective: LO 13-5

44) Ranger Electronics Ltd. manufactures a variety of high quality electronic components. Data from the last three months are presented below:

	April	May	June
Direct materials partial productivity	0.85	0.86	0.87
Overtime hours worked	80	75	72
Defect rate	2.00%	1.95%	1.92%
On time delivery	98.0%	98.3%	98.0%
Set up time (average in hours)	6.90	6.85	6.80
Number of machine breakdowns	2	1	1
Downtime (hours)	12.0	11.5	11.25
Number of products returned	6	5	4
Throughput time (hours)	12.0	11.8	11.5

You are the new assistant controller for Ranger and the controller has asked you to review the performance over the last 3 months and write a summary analysis with your recommendations for follow up or further monitoring. In addition, the controller notes that the company, although it has many detailed performance measures, is considering implementing a balanced scorecard and asks you to identify the measures you think would be most appropriate to include in the balanced scorecard.

Required:

Evaluate the performance of Ranger Electronics over the 3 month period.

*Answer: Note responses may be in short formal report or memo format. This is an open ended question and student responses will vary. Instructors may wish to add details to guide students more in their analysis (for example, instructors may wish to advise students that the product mix remained constant over the 3 month period).*

*Productivity Considerations:*

The plant's throughput time has improved from 12 hours to 11.5 hours. Setup time has also dropped from an average of 6.9 hours to 6.8 hours. This might indicate that the efficiency of the actual processing of products has improved, or it might indicate a different product mix in production with different average throughput time. Different types of production runs may necessitate different types of setups. If the product mix is constant, then this is an indicator of efficiency. Overtime hours have decreased which may be a result of overall volume of demand decreasing, or perhaps less urgency of demand (better planning? customer expectations for delivery?). The DM partial productivity has improved as the ratio of outputs produced to inputs used has increased. Downtime is down which may indicate efficient production scheduling, but could also be an indicator of product mix and customer demand.

*Quality Considerations:*

The company is performing well with respect to quality. The defect rate is down and the number of products returned has declined. In addition, machine breakdowns have declined. Downtime is down, this may be related to the lower breakdowns. Since the company is a manufacturer of high quality products, the quality dimension is important.

*Customer Considerations:*

On time delivery is high at 98+%. It improved in May but fell back to April's level in June. Additional information would be useful to determine whether the 98% level is competitive for the industry. Again, the defect rate is down and the number of products returned has declined. However, we do not have information on total volumes of product sold, so it is not clear if the return RATE has changed.

#### *Financial Considerations:*

We do not have specific information on the financial dimensions of performance. However, high DM productivity, lower overtime, lower defects, lower returns, lower setup hours, lower throughput time, lower downtime and lower breakdowns are all indicators of improvements which would suggest favourable efficiency variances. We do not know the prices of the inputs though.

#### *Recommendations:*

Investigate causes for overtime. Although the hours are declining, overtime increases unit costs due to overtime premiums for labour. Is the overtime a result of heavy demand, poor production scheduling, shortage of raw materials? Is the on-time delivery rate consistent with industry expectations? Why was it higher in May and can this be replicated?

Since the company is a manufacturer of high quality components, can the reporting be extended to include more aspects of quality reporting (prevention, appraisal, internal and external failure)?

#### *Balanced Scorecard Considerations:*

The important points for students to note are:

1. BSC should be linked to the company's mission. Since we do not have the mission statement, we are limited in our analysis; however, the quality dimension is important. Therefore # of returns would be an important measure. On time delivery may be important to customers, but perhaps there are other aspects of quality that are more important (service?). In the internal business processes dimension, defect rate is a measure directly linked to the quality dimension. There are quite a few productivity and measures that relate to the internal business processes. The company should select the ones that best link to its mission. As noted, financial measures are missing; cost of quality measures may be added. Learning and growth measures are also missing. Innovation measures (# of new products) likely link well to mission of quality.
2. The number of measures should be limited. While, for example, there are many internal business processes measures, not all of these measures should be elevated to the strategic level.
3. BSC should include several dimensions. Traditionally the four dimensions are Customer, Financial, Internal Business Processes and Learning & Growth. The performance measurement, for strategic BSC, needs to be broader.

Diff: 3 Type: ES

Skill: Analyze

Objective: Cumulative



45) Granger Electronics Ltd. manufactures a variety of high quality electronic components. Data from the last three months are presented below:

	April	May	June
Direct materials partial productivity	0.75	0.76	0.77
Overtime hours worked	60	65	62
Defect rate	1.00%	0.95%	0.92%
On time delivery	97.0%	97.3%	97.0%
Set up time (average in hours)	5.90	5.85	5.80
Number of machine breakdowns	3	2	2
Downtime (hours)	15.0	11.5	11.0
Number of products returned	5	4	3
Throughput time (hours)	10.0	9.8	9.5

You are the new assistant controller for Granger and the controller has asked you to review the performance over the last 3 months and write a summary analysis with your recommendations for follow up or further monitoring. In addition, the controller notes that the company, although it has many detailed performance measures, is considering implementing a balanced scorecard and asks you to identify the measures you think would be most appropriate to include in the balanced scorecard.

Required:

Evaluate the performance of Granger Electronics over the 3 month period.

*Answer: Note responses may be in short formal report or memo format. This is an open ended question and student responses will vary. Instructors may wish to add details to guide students more in their analysis (for example, instructors may wish to advise students that the product mix remained constant over the 3 month period).*

*Productivity Considerations:*

The plant's throughput time has improved from 10 hours to 9.5 hours. Setup time has also dropped from an average of 5.9 hours to 5.8 hours. This might indicate that the efficiency of the actual processing of products has improved, or it might indicate a different product mix in production with different average throughput time. Different types of production runs may necessitate different types of setups. If the product mix is constant, then this is an indicator of efficiency. Overtime hours have decreased which may be a result of overall volume of demand decreasing, or perhaps less urgency of demand (better planning? customer expectations for delivery?). The DM partial productivity has improved as the ratio of outputs produced to inputs used has increased. Downtime is down which may indicate efficient production scheduling, but could also be an indicator of product mix and customer demand.

*Quality Considerations:*

The company is performing well with respect to quality. The defect rate is down and the number of products returned has declined. In addition, machine breakdowns have declined. Downtime is down, this may be related to the lower breakdowns. Since the company is a manufacturer of high quality products, the quality dimension is important.

*Customer Considerations:*

On time delivery is high at 97+%. It improved in May but fell back to April's level in June. Additional information would be useful to determine whether the 97% level is competitive for the industry. Again, the defect rate is down and the number of products returned has declined. However, we do not have information on total volumes of product sold, so it is not clear if the return RATE has changed.

*Financial Considerations:*

We do not have specific information on the financial dimensions of performance. However, high DM productivity, lower overtime, lower defects, lower returns, lower setup hours, lower throughput time, lower downtime and lower breakdowns are all indicators of improvements which would suggest favourable efficiency variances. We do not know the prices of the inputs though.

*Recommendations:*

Investigate causes for overtime. Although the hours are declining, overtime increases unit costs due to overtime premiums for labour. Is the overtime a result of heavy demand, poor production scheduling, shortage of raw materials? Is the on-time delivery rate consistent with industry expectations? Why was it higher in May and can this be replicated?

Since the company is a manufacturer of high quality components, can the reporting be extended to include more aspects of quality reporting (prevention, appraisal, internal and external failure)?

*Balanced Scorecard Considerations:*

The important points for students to note are:

1. BSC should be linked to the company's mission. Since we do not have the mission statement, we are limited in our analysis; however, the quality dimension is important. Therefore # of returns would be an important measure. On time delivery may be important to customers, but perhaps there are other aspects of quality that are more important (service?). In the internal business processes dimension, defect rate is a measure directly linked to the quality dimension. There are quite a few productivity and measures that relate to the internal business processes. The company should select the ones that best link to its mission. As noted, financial measures are missing; cost of quality measures may be added. Learning and growth measures are also missing. Innovation measures (# of new products) likely link well to mission of quality.
2. The number of measures should be limited. While, for example, there are many internal business processes measures, not all of these measures should be elevated to the strategic level.
3. BSC should include several dimensions. Traditionally the four dimensions are Customer, Financial, Internal Business Processes and Learning & Growth. The performance measurement, for strategic BSC, needs to be broader.

Diff: 3 Type: ES

Skill: Analyze

Objective: Cumulative

46) Define engineered and discretionary costs and give two examples of each.

Answer: An engineered cost results from a cause-and-effect relationship between the cost driver output and the resources used to produce that output. An example of an engineered cost would be direct materials in the production of products. Other examples of engineered costs might include shipping costs or electrical costs. A discretionary cost has two features. The first feature is that the cost arises from a periodic decision regarding the amount of cost to be incurred. The second feature is that no measurable cause-and-effect relationship exists between the output and the resources used. An example of a discretionary cost would be the cost of advertising for a product, the amount spent on researching new products, or employee training expenses.

Diff: 2 Type: ES

Skill: Remember

Objective: LO 13-5

47) Can a company identify unused capacity and, if so, how can unused capacity be managed?

Answer: It is relatively easy for a company to recognize unused capacity for engineered costs, but it is more difficult for a company to recognize unused capacity for discretionary costs. Downsizing, or rightsizing, is an approach to managing unused capacity by matching costs to the activities that need to be performed.

Diff: 2 Type: ES

Skill: Analyze

Objective: LO 13-5

48) Ralph Company has been very aggressive in developing various types of financial and nonfinancial measurement schemes to help with the evaluation of its manufacturing processes. It appears that some of the managers are suboptimizing in that their decision processes are geared solely for their department's benefit, sometimes to the detriment of the organization as a whole.

Required:

What changes in the evaluation system could the company implement to help minimize the suboptimization of the managers' decision-making process?

Answer: The company could implement a total factor productivity concept. Its major advantage is that it measures the combined productivity of all inputs to produce outputs and, therefore, explicitly evaluates substitution among inputs. For example, if buying a cheap material makes the cost of materials look favourable but causes more labour-hours, therefore causing labour costs to be unfavourable, suboptimization may be occurring. The total factor productivity takes into account both the materials costs and the labour costs and if they offset each other, that is fine, but if they do not offset, then the variance will be so noted.

Diff: 2 Type: ES

Skill: Analyze

Objective: LO 13-5

49) Total factor productivity (TFP) is easy to compute for a single-product company. When dealing with a multiproduct company, one of two adjustments must be made. What are these potential adjustments?

Answer: One of the following two adjustments must be made in the TFP calculations:

1. Convert the outputs from physical measures to a dollar value common denominator, analogous to the multiple input case.
2. Allocate the input costs to the different outputs. This is appropriate when the inputs can be reasonably allocated to the different outputs.

Diff: 2 Type: ES

Skill: Analyze

Objective: LO 13-5