

Supply Chain Management, 6e (Chopra/Meindl)
Chapter 17 Sustainability and the Supply Chain

17.1 True/False Questions

1) A focus on sustainability allows a supply chain to better serve more environmentally conscious customers while often improving supply chain performance.

Answer: TRUE

Diff: 1

Topic: 17.1 The Role of Sustainability in a Supply Chain

AACSB: Ethical understanding and reasoning

Objective: LO 17.1: Understand the importance of sustainability in a supply chain.

2) Walmart started its focus on sustainability as a defensive move given the beating it was taking from environmental activists.

Answer: TRUE

Diff: 2

Topic: 17.1 The Role of Sustainability in a Supply Chain

AACSB: Ethical understanding and reasoning

Objective: LO 17.1: Understand the importance of sustainability in a supply chain.

3) Customers have usually backed up words about the importance of sustainability with a willingness to pay more for sustainable products.

Answer: FALSE

Diff: 2

Topic: 17.1 The Role of Sustainability in a Supply Chain

AACSB: Ethical understanding and reasoning

Objective: LO 17.1: Understand the importance of sustainability in a supply chain.

4) Hardin (1968) described the *tragedy of the commons* as a dilemma arising when the common good does not align perfectly with the good of individual entities.

Answer: TRUE

Diff: 1

Topic: 17.2 The Tragedy of the Commons

AACSB: Ethical understanding and reasoning

Objective: LO 17.2: Discuss the challenge to sustainability posed by the tragedy of the commons.

5) The Intergovernmental Panel on Climate Change, a United Nations body that has been assessing global warming since 1990, has written that even though most of the buildup of carbon dioxide in the atmosphere has come from the United States and Western Europe, it is poorer countries that are closer to the equator that are likely to pay the biggest price.

Answer: TRUE

Diff: 1

Topic: 17.2 The Tragedy of the Commons

AACSB: Analytical thinking

Objective: LO 17.2: Discuss the challenge to sustainability posed by the tragedy of the commons.

6) In reality, there are no actions in a supply chain that improve both sustainability and supply chain surplus.

Answer: FALSE

Diff: 1

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

7) An example of a relative measure of emission output is *pounds of CO₂ per gallon of diesel fuel*.

Answer: FALSE

Diff: 2

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

8) The social pillar measures a firm's ability to address issues that are important for its workforce, customers, and society.

Answer: TRUE

Diff: 2

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

9) A firm's new sustainability improvement initiative is best begun by focusing on resource reduction activities.

Answer: TRUE

Diff: 2

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

10) For most firms, the extent of direct emissions is typically only a small fraction of the extent of indirect emissions in the supply chain.

Answer: TRUE

Diff: 3

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

11) Facilities often offer the best opportunity to simultaneously improve the environmental and financial performance through innovation.

Answer: TRUE

Diff: 1

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

12) Most supply chain design innovations that lower transportation costs paradoxically tend to increase fuel consumption and emissions.

Answer: FALSE

Diff: 1

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

13) There is greater environmental impact in the extended supply chain than there is within the main plant for most manufacturers.

Answer: TRUE

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

14) Simple awareness of what your own electricity consumption is usually reduces a consumer's electricity use by between 10% and 15%.

Answer: TRUE

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

15) Surveys in sustainable farming have revealed that the typical consumer is willing to pay 25% more for sustainable fare.

Answer: FALSE

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

16) The primary reason for the general lack of design for remanufacturing is that remanufacturing is more expensive for a manufacturer.

Answer: FALSE

Diff: 2

Topic: 17.5 Closed Loop Supply Chains

AACSB: Analytical thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

17) In general, the reverse logistics function for a manufacturer is more expensive to operate on a per unit basis than the forward logistics function that sends the products to market.

Answer: TRUE

Diff: 2

Topic: 17.5 Closed Loop Supply Chains

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

18) If garbage collection services were billed based on the weight of refuse collected, most people would find a way to discard less and recycle more.

Answer: TRUE

Diff: 1

Topic: 17.5 Closed Loop Supply Chains

AACSB: Analytical thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

19) A carbon tax system is computed by multiplying the tax rate by the carbon emissions.

Answer: TRUE

Diff: 1

Topic: 17.6 The Pricing of Sustainability

AACSB: Analytical thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

20) Under a cap-and-trade system, a firm that emits more than its share of carbon can buy allowances from a firm that emits less than its share.

Answer: TRUE

Diff: 1

Topic: 17.6 The Pricing of Sustainability

AACSB: Analytical thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

17.2 Multiple Choice Questions

- 1) Most concrete action has been observed primarily when a focus on sustainability
- A) increases revenue for sustainability initiatives.
 - B) makes the world more sustainable.
 - C) attracts customers who value sustainability.
 - D) reduces risk and improving the financial performance of the supply chain.

Answer: D

Diff: 2

Topic: 17.1 The Role of Sustainability in a Supply Chain

AACSB: Analytical thinking

Objective: LO 17.1: Understand the importance of sustainability in a supply chain.

- 2) Much less success for sustainability initiatives has been driven by
- A) increased revenue for sustainability initiatives.
 - B) customer demand.
 - C) attracted customers who value sustainability.
 - D) reduced risk and improving the financial performance of the supply chain.

Answer: B

Diff: 1

Topic: 17.1 The Role of Sustainability in a Supply Chain

AACSB: Analytical thinking

Objective: LO 17.1: Understand the importance of sustainability in a supply chain.

- 3) Almost 40 percent of _____ could be achieved at negative marginal costs, meaning that investing in these options would generate positive economic returns over their life cycle.

- A) greenhouse gas abatement
- B) fuel consumption initiatives
- C) increased customer base
- D) improved company reputation

Answer: A

Diff: 1

Topic: 17.1 The Role of Sustainability in a Supply Chain

AACSB: Analytical thinking

Objective: LO 17.1: Understand the importance of sustainability in a supply chain.

4) Unilever, the Dutch-British consumer goods giant, has invested significant effort to help emerging economies such as Brazil and India wrestle with poverty, water scarcity and climate change. The company sees _____ of its sales and the majority of its growth coming from emerging economies.

- A) almost 25%
- B) almost 50%
- C) almost 60%
- D) almost 75%

Answer: B

Diff: 3

Topic: 17.1 The Role of Sustainability in a Supply Chain

AACSB: Ethical understanding and reasoning

Objective: LO 17.1: Understand the importance of sustainability in a supply chain.

5) Walmart reduced its energy consumption by

- A) adding skylights for natural light.
- B) reducing packaging.
- C) milk jug redesign.
- D) better transportation routing of trucks.

Answer: A

Diff: 3

Topic: 17.1 The Role of Sustainability in a Supply Chain

AACSB: Analytical thinking

Objective: LO 17.1: Understand the importance of sustainability in a supply chain.

6) In the short to medium term, an improved focus on sustainability provides benefits that

- A) are shared but costs that may be local to a firm.
- B) are local to firms but a cost that is global.
- C) are shared and costs that are global.
- D) are local and costs that are global.

Answer: A

Diff: 3

Topic: 17.1 The Role of Sustainability in a Supply Chain

AACSB: Reflective thinking

Objective: LO 17.1: Understand the importance of sustainability in a supply chain.

7) The phenomenon where each actor is incentivized to maximize his gain from a public asset at the expense of all others is

- A) the tragedy of the commons.
- B) cap-and-trade.
- C) the closed loop.
- D) the social pillar.

Answer: A

Diff: 2

Topic: 17.2 The Tragedy of the Commons

AACSB: Analytical thinking

Objective: LO 17.2: Discuss the challenge to sustainability posed by the tragedy of the commons.

8) _____ is a social arrangement that encourages all participants to behave such that they do not contribute to the tragedy of the commons.

- A) A zero sum game
- B) Escalation of commitment
- C) Mutual coercion
- D) Barzini Red

Answer: C

Diff: 2

Topic: 17.2 The Tragedy of the Commons

AACSB: Analytical thinking

Objective: LO 17.2: Discuss the challenge to sustainability posed by the tragedy of the commons.

9) _____ is a mechanism that constrains the aggregate emissions by creating a limited number of tradeable emission allowances, which emission sources must secure and surrender in proportion to their emissions.

- A) Command-and-control
- B) Cap-and-trade
- C) Cap-and-control
- D) Emissions tax

Answer: B

Diff: 2

Topic: 17.2 The Tragedy of the Commons

AACSB: Analytical thinking

Objective: LO 17.2: Discuss the challenge to sustainability posed by the tragedy of the commons.

10) Metrics that would typically be in corporate social responsibility (CSR) reports would contain

- A) revenue.
- B) social.
- C) environmental.
- D) Both B and C

Answer: D

Diff: 2

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

11) In the context of greenhouse gas emission, the GHG protocol initiative defines three levels of scope. The following scope is referred to as direct emissions.

- A) This scope refers to emissions from GHG sources that are owned or controlled by the reporting entity.
- B) This scope refers to indirect emissions from grid-sourced electricity and other utility services of heat, steam and cooling.
- C) This scope refers to the inclusion of other indirect emissions coming from sources such as the production of purchased materials, outsourced activities, contractor owned vehicles, waste disposal, and employee business travel.
- D) This scope refers to the corporate responsibility for direct discharging of emissions into public water systems.

Answer: A

Diff: 3

Topic: 17.3 Key Pillars of Sustainability

AACSB: Reflective thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

12) A(n) _____ measure of performance is more effective at capturing sustainability improvement.

- A) scope
- B) relative
- C) absolute
- D) statistical

Answer: B

Diff: 2

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

13) In the context of greenhouse gas emission, the GHG protocol initiative defines levels of scope. This level refers to emissions from GHG sources that are owned or controlled by the reporting entity.

A) Scope 1

B) Scope 2

C) Scope 3

D) Scope 4

Answer: A

Diff: 3

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

14) In the context of greenhouse gas emission, the GHG protocol initiative defines levels of scope. This level refers to the inclusion of other indirect emissions coming from sources such as the production of purchased materials, outsourced activities, contractor owned vehicles, waste disposal, and employee business travel.

A) Scope 1

B) Scope 2

C) Scope 3

D) Scope 4

Answer: C

Diff: 3

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

15) In the context of greenhouse gas emission, the GHG protocol initiative defines levels of scope. This level refers to indirect emissions from grid-sourced electricity and other utility services of heat, steam and cooling.

A) Scope 1

B) Scope 2

C) Scope 3

D) Scope 4

Answer: B

Diff: 3

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

16) In the context of greenhouse gas emission, direct emissions

- A) are controlled by the reporting entity.
- B) are created through waste disposal.
- C) come from utility-based services.
- D) come from employee-based travel.

Answer: A

Diff: 3

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

17) In the textbook, a detailed analysis by Abbott indicated that their indirect emissions were about _____ times their direct emissions.

- A) 1 to 5
- B) 6 to 14
- C) 15 to 19
- D) 20 to 22

Answer: B

Diff: 2

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

18) The disadvantage of using a(n) _____ measure is that a drop in supply chain sales and production (for example in a downturn) will show an improved absolute measure of energy consumption even though the company may not have changed anything.

- A) scope
- B) relative
- C) absolute
- D) statistical

Answer: C

Diff: 3

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

19) A(n) _____ measure of performance is more effective at capturing improvement.

- A) scope
- B) relative
- C) absolute
- D) statistical

Answer: B

Diff: 3

Topic: 17.3 Key Pillars of Sustainability

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

20) _____ tend to be significant consumers of energy and water and emitters of waste and greenhouse gases and thus offer significant opportunities for profitable improvement.

- A) Employees
- B) Production processes
- C) Facilities
- D) Vehicles

Answer: C

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

21) According to its 2011 CSR report, _____ has designed and opened a viable store prototype that is up to 25 to 30 percent more energy efficient and produces up to 30 percent fewer greenhouse gas emissions compared to the 2005 baseline.

- A) Starbucks
- B) TJ Maxx
- C) Walmart
- D) Kmart

Answer: C

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

22) Walmart has worked to convert _____ at its stores from a cost to a profit generator.

- A) energy usage
- B) waste generation
- C) water consumption
- D) reduced packaging

Answer: B

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

23) Walmart reported that in California, over _____ percent of waste has been diverted from landfills and made into something else that produces revenue.

- A) 25
- B) 40
- C) 60
- D) 80

Answer: D

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

24) _____ has worked hard to reuse heat energy from boilers in its production process and reduce its total water footprint.

- A) Walmart
- B) Coca-Cola
- C) IBM
- D) Starbucks

Answer: B

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

25) _____ worked with their equipment supplier, Siemens VAI, to create a new production process that cut costs and emissions by using local iron ore that was of lower quality but cheaper.

- A) Walmart
- B) Coca-Cola
- C) Posco
- D) Starbucks

Answer: C

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

26) What type of inventory is one of the most damaging from a sustainability perspective?

- A) Raw materials
- B) Work in process
- C) Finished goods
- D) Landfill

Answer: D

Diff: 1

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Reflective thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

27) The sustainability damage from landfill additives comes in which form?

- A) Potential energy lost
- B) Materials lost
- C) Terrible smell
- D) Both A and B

Answer: D

Diff: 1

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

28) _____ can be used to assess the environmental impacts associated with a product's life from cradle to grave.

- A) CRM
- B) SRM
- C) LCA
- D) MRP

Answer: A

Diff: 3

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

29) _____ reduced the amount of harmful phosphates in laundry and dish detergents in the Americas region by 14.5 percent in 2011 with a goal of reaching a reduction of 70 percent.

- A) Walmart
- B) BASF
- C) 3M
- D) Procter & Gamble

Answer: A

Diff: 3

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

30) _____ has always worked hard to design products that can be shipped flat to achieve high volume and weight density during transportation. As a result, the company not only lowers its transportation costs, it also reduces emissions and energy use.

- A) Walmart
- B) IKEA
- C) 3M
- D) Procter & Gamble

Answer: B

Diff: 3

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

31) The presence of lead paint in some of its most popular toys forced _____ to recall hundreds of thousands of toys sold between April and July of 2007.

- A) Walmart
- B) Hasbro
- C) Mattel
- D) Remco

Answer: C

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

32) _____ continues to be one of the biggest challenges to improved supply chain sustainability.

- A) Good information
- B) Waste generation
- C) Water consumption
- D) Reducing packaging

Answer: A

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Reflective thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

33) Walmart implemented a web-based scorecard that evaluated the packaging of each product along nine metrics which included

- A) cube utilization.
- B) distance traveled.
- C) recycled content.
- D) Both A and C

Answer: D

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

34) This company has not hit its targets for the use of renewable energy because these sources have higher costs compared to other sources of energy. In general, the public has not been willing to pay for the added costs.

- A) Walmart
- B) IKEA
- C) IBM
- D) 3M

Answer: A

Diff: 1

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

35) These two companies have also set aggressive targets for their suppliers to improve overall supply chain sustainability.

- A) Walmart and IKEA
- B) IBM and 3M
- C) Mattel and Hasbro
- D) Apple and Starbucks

Answer: A

Diff: 1

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

36) McDonough and Braungart (2002) discuss the importance of _____ design if we are to truly limit the landfill inventory generated by a supply chain.

- A) cradle to grave
- B) cradle to cradle
- C) manageable sustainability
- D) recyclable content

Answer: B

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Analytical thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

37) The goal of every supply chain should be to track its

- A) landfill inventory.
- B) transportation utilization.
- C) water consumption.
- D) packaging materials.

Answer: A

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Reflective thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

38) The *polluter pays* principle dictates that

- A) recycling efforts are best aimed at the designer of the product.
- B) the entity causing the pollution must bear the cost to society.
- C) the recycler should receive compensation from the end user of the product.
- D) the recycler should receive compensation from the designer of the product.

Answer: B

Diff: 2

Topic: 17.5 Closed Loop Supply Chains

AACSB: Reflective thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

39) The major deterrent to remanufacturing is

- A) the comparatively low margin of remanufactured to newly-produced products.
- B) the comparatively high cost of remanufacturing to newly-produced products.
- C) the fear that remanufactured products will be purchased instead of newly-produced products.
- D) the loss of recycling volume from remanufactured products that do not enter the recycling stream.

Answer: C

Diff: 2

Topic: 17.5 Closed Loop Supply Chains

AACSB: Reflective thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

40) Remanufacturing helps improve profits as long as

- A) the comparatively low margin of remanufactured to newly-produced products exists.
- B) the comparatively high cost of remanufacturing to newly-produced products exists.
- C) the fear exists that remanufactured products will be purchased instead of newly-produced products.
- D) two distinct segments of demand exist for the product — one for new and one for old products.

Answer: D

Diff: 2

Topic: 17.5 Closed Loop Supply Chains

AACSB: Reflective thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

41) The *Pay as You Throw* (PAYT) model is designed to

- A) increase recycling.
- B) decrease throwing.
- C) increase consumption.
- D) decrease consumption.

Answer: A

Diff: 2

Topic: 17.5 Closed Loop Supply Chains

AACSB: Reflective thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

42) Much of the actual cost of recycling or remanufacturing is directly linked to:

- A) the repair.
- B) the logistics.
- C) the production.
- D) the design.

Answer: B

Diff: 2

Topic: 17.5 Closed Loop Supply Chains

AACSB: Reflective thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

43) For individuals and firms to focus on sustainability, it is crucial that they

- A) reject the model of maximization of shareholder wealth as the firm objective.
- B) adhere to ISO 14000 standards.
- C) internalize the monetary value of the social/environmental cost of their actions.
- D) include language in the corporate mission, vision, and values statements about sustainability.

Answer: C

Diff: 2

Topic: 17.6 The Pricing of Sustainability

AACSB: Reflective thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

44) Reducing greenhouse gas emissions was most cost effectively achieved by

- A) rejecting the model of maximization of shareholder wealth as the firm objective.
- B) adherence to ISO 14000 standards.
- C) subsidizing companies that
- D) charging for emissions.

Answer: D

Diff: 2

Topic: 17.6 The Pricing of Sustainability

AACSB: Reflective thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

45) Under a carbon tax system, the price of emissions is

- A) the tax rate set directly by the regulatory authority.
- B) decided by the emitters.
- C) determined by the fraction of total carbon assignable to the company.
- D) agreed upon by all firms competing for the same pool of customers.

Answer: A

Diff: 2

Topic: 17.6 The Pricing of Sustainability

AACSB: Reflective thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

46) Under a cap and trade system, the price of emissions is

- A) determined directly as a function of the output.
- B) determined indirectly and can change.
- C) determined indirectly and is invariant.
- D) determined directly and is invariant.

Answer: B

Diff: 2

Topic: 17.6 The Pricing of Sustainability

AACSB: Reflective thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

47) The market for carbon allowances

- A) does not exist in a hybrid cap and trade system.
- B) is a key element of a carbon tax system.
- C) can result in a heavier polluter buying allowances from a company with lower carbon output.
- D) is set by the regulatory authority.

Answer: C

Diff: 2

Topic: 17.6 The Pricing of Sustainability

AACSB: Reflective thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

48) One advantage of a carbon tax system over a cap and trade system is

- A) the carbon tax system is less expensive.
- B) the carbon tax system is more expensive.
- C) that emissions under the cap and trade system cannot be monitored by outside agencies.
- D) the carbon tax system displays more price stability.

Answer: D

Diff: 2

Topic: 17.6 The Pricing of Sustainability

AACSB: Reflective thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

49) An energy exporting country stands to gain

- A) under a cap and trade system if the supply of crude is kept below the level achieved with a price on emissions.
- B) under a cap and trade system if the supply of crude is kept over the level achieved with a price on emissions.
- C) under a carbon tax system if the supply of crude is kept below the level achieved with a price on emissions.
- D) under a carbon tax system if the supply of crude is kept over the level achieved with a price on emissions.

Answer: A

Diff: 2

Topic: 17.6 The Pricing of Sustainability

AACSB: Reflective thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

- 50) A cap and trade system can achieve price stability as long as
- A) a price floor is established.
 - B) intertemporal banking of emission allowances is allowed.
 - C) both a price floor and intertemporal banking of emissions allowances are allowed.
 - D) both a price floor and a price ceiling are established.

Answer: C

Diff: 2

Topic: 17.6 The Pricing of Sustainability

AACSB: Reflective thinking

Objective: LO 17.4: Understand the role of incentives for successful sustainability efforts.

17.3 Essay Questions

- 1) Discuss the role of sustainability supply chains.

Answer: This is a general question and many answers would suffice in answering it. Answers should be similar to the following comments.

Each supply chain is only a small part of the world it resides in. Ultimately the health and survival of every individual depends on the health of the world around us. It is thus important to expand the goal of a supply chain beyond the interests of its participants (which the supply chain surplus represents) to others that may be affected by supply chain decisions. It is in this context that the 21st century has seen a growing focus on sustainability. The focus on sustainability has increased as large countries like Brazil, China and India have grown. On the one hand, the growth of emerging markets is improving global living standards in a way that perhaps has not happened before in human history. On the other hand, this growth puts pressure on resources and the environment in a way that has also never happened before. It has become increasingly clear that if supply chains do not become much more sustainable than they have been in the past, the world's resources and environment cannot sustain this level of growth.

Diff: 2

Topic: 17.1 The Role of Sustainability in a Supply Chain

AACSB: Reflective thinking

Objective: LO 17.1: Understand the importance of sustainability in a supply chain.

2) Discuss the factors driving an increased focus on sustainability.

Answer: First, they can be divided into three distinct categories:

1. Reducing risk and improving the financial performance of the supply chain
2. Attracting customers who value sustainability
3. Making the world more sustainable

Most action has been observed primarily when a focus on sustainability reduces risk for the supply chain and improves financial performance. Much less success has been driven by customer demand or the desire to make the world more sustainable. It is interesting to note that there is significant opportunity even if supply chains only focus on the areas that reduce risk and improve financial performance. Customers to this point have not been willing to pay extra for sustainable products as a whole even though many customers are environmentally sensitive. As such, macro policies may be one of the best options for improving the sustainability of all supply chains.

Diff: 2

Topic: 17.1 The Role of Sustainability in a Supply Chain

AACSB: Reflective thinking

Objective: LO 17.1: Understand the importance of sustainability in a supply chain.

3) What are the challenges to greater sustainability posed by the tragedy of the commons?

Answer: The *tragedy of the commons* is a dilemma arising when the common good does not align perfectly with the good of individual entities. Many actions that improve sustainability of a supply chain impose costs that are local (to an individual, a firm, supply chain or country) but provide common benefits that are more global. In contrast, a disregard for sustainability provides benefits that are local but costs that are shared globally. As a result, it can be difficult to encourage sustainability without some external pressure either in the form of a public mandate or economic incentive.

Diff: 2

Topic: 17.2 The Tragedy of the Commons

AACSB: Reflective thinking

Objective: LO 17.2: Discuss the challenge to sustainability posed by the tragedy of the commons.

4) What are some metrics that can be used to measure sustainability for a supply chain?

Answer: There are many metrics—both quantitative and qualitative—that can be used to measure sustainability in a supply chain. Some measures mentioned in the chapter include energy consumption, water consumption, greenhouse gas emission, and waste generation. It is important that these metrics be tracked across as wide a scope of the supply chain as possible. One measure discussed at length was that of landfill inventory. A qualitative measure of landfills would be the amount of undesirable odor created by the landfill inventory. A following quantitative measure is the loss of value for potential production or residential development due to the inherent odors.

Diff: 2

Topic: 17.3 Key Pillars of Sustainability

AACSB: Reflective thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.

5) What are some opportunities for improved sustainability in various supply chain drivers?

Answer: There are many drivers associated with improved sustainability for supply chains. Facilities can be redesigned to reduce both energy use and emissions. Products should be designed with a "cradle to cradle" philosophy to decrease landfill inventory and increase the reuse of material. Designing products to limit packaging and improve transportation density helps reduce costs as well as emissions during transportation. Given that any one firm is only a small fraction of a supply chains impact on the environment, it is critical that powerful players work with the extended supply chain to improve sustainability. Clearly defined standards for measurement and reporting of performance are important if sustainability is to improve across supply chains. Finally, a significant driver of improved sustainability will be customers' willingness to reward successful supply chains.

Diff: 2

Topic: 17.4 Sustainability and Supply Chain Drivers

AACSB: Reflective thinking

Objective: LO 17.3: Describe key dimensions of sustainability for a supply chain.