

***Matching Supply with Demand 5th edition Cachon
Test Bank***

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CORRECT ANSWERS ARE LOCATED IN THE 2ND HALF OF THIS DOC.

TRUE/FALSE - Write 'T' if the statement is true and 'F' if the statement is false.

- 1) The tool that is used to provide a graphical representation of the activities in a process is the strategic plan.
 - ☐ true
 - ☐ false
- 2) All of the activities that, if delayed, would lead to a delay in the overall completion of a project is called a critical path.
 - ☐ true
 - ☐ false
- 3) The number of flow units contained in a production process is called inventory.
 - ☐ true
 - ☐ false
- 4) The amount of time it takes for a unit to get through a process is called flow time.
 - ☐ true
 - ☐ false
- 5) The rate at which a process is delivering output is called the efficiency rate.
 - ☐ true
 - ☐ false
- 6) The maximum rate at which a process can generate supply is called the upper limit point.
 - ☐ true
 - ☐ false
- 7) If the bottled water industry produces 600 million bottles per year, then this is its flow/throughput rate.
 - ☐ true
 - ☐ false
- 8) If a consumer electronics corporation makes wireless phones, then wireless phones are its flow unit.
 - ☐ true
 - ☐ false

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- 9) Shorter flow times help to reduce supply-demand mismatches in various industries.
- ☐ true
 - ☐ false
- 10) Inventory and flow time are typically the same value.
- ☐ true
 - ☐ false
- 11) Little's Law is defined as $\text{Average inventory} = \text{Average flow rate} \times \text{Average flow time}$.
- ☐ true
 - ☐ false
- 12) Little's Law will hold as true in about 80 percent of situations.
- ☐ true
 - ☐ false
- 13) When calculating the inventory turns and per-unit inventory costs, the first step in the process is to look up the cost of goods sold from the company's earnings statement.
- ☐ true
 - ☐ false
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- 14) When calculating the inventory turns and per-unit inventory costs, the second step in the process is to look up sales from the company's earnings statement.
- ☐ true
 - ☐ false
- 15) When calculating the inventory turns and per-unit inventory costs, the second step in the process is to look up sales from the company's earnings statement.
- ☐ true
 - ☐ false
- 16) When calculating the inventory turns and per-unit inventory costs, the second step in the process is to look up sales from the company's earnings statement.
- ☐ true
 - ☐ false

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- 17) When calculating the inventory turns and per-unit inventory costs, the third step in the process is to compute the inventory turns as COGS/inventory.
- ☐ true
☐ false
- 18) When calculating the inventory turns and per-unit inventory costs, the fourth step in the process is to compute the per-unit inventory costs as annual inventory costs/inventor turns.
- ☐ true
☐ false
- 19) The basic inventory on which a process operates is called the pipeline inventory.
- ☐ true
☐ false
- 20) Seasonal inventory occurs when capacity is flexible and demand is fixed.
- ☐ true
☐ false
- 21) Cycle inventory is a key reason for holding inventory as it takes advantage of scale economies in operations.
- ☐ true
☐ false
- 22) An inventory buffer requires management to coordinate the steps in a process in an interdependent manner.
- ☐ true
☐ false
- 23) Stochastic demand is *not* generally a significant factor in relation to inventory management.
- ☐ true
☐ false
- 24) Based on the product-process matrix, low-volume production is associated with the use of a machine-paced line.
- ☐ true
☐ false

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25) Based on the product-process matrix, very high-volume production is associated with the use of a job shop.

- ☐ true
- ☐ false

MULTIPLE CHOICE - Choose the one alternative that best completes the statement or answers the question.

26) The three measures of process performance include

- A) costs.
- B) flow time.
- C) sales.
- D) customer satisfaction.
- E) input quality.

27) A process flow diagram will include

- A) inputs.
- B) process.
- C) outputs.
- D) inputs and outputs only.
- E) All of the choices are correct.

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28) If manufacturing personal beauty and care products is the focus of a consumer products company, then the personal beauty and care products are referred to as the

- A) flow rate.
- B) input.
- C) output.
- D) flow unit.
- E) resource.

29) An automobile manufacturer is able to produce 700 luxury crossover vehicles per day. Based on this, the 700 units produced each day are referred to as the

- A) process capacity.
- B) flow rate.
- C) work in process.
- D) flow time.
- E) flow unit.

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- 30) The formula for average inventory that says that $\text{Average inventory} = \text{Average flow rate} \times \text{Average flow time}$ is called
- A) Stochastic Law.
 - B) Inventory turns Law.
 - C) Murphy's Law.
 - D) Little's Law.
 - E) Per-unit inventory Law.
- 31) Based on Little's Law, inventory/flow rate is used to compute
- A) process capacity.
 - B) flow time.
 - C) demand.
 - D) efficiency.
 - E) process quality.
- 32) Based on Little's Law, $1/\text{flow time}$ is the formula used to compute
- A) process capacity.
 - B) flow time.
 - C) inventory turn.
 - D) efficiency.
 - E) process quality.
- 33) The formula of annual inventory cost/annual inventory turns is used to calculate the
- A) per-unit inventory cost.
 - B) flow rate.
 - C) process capacity.
 - D) flow efficiency.
 - E) cost of goods sold.
- 34) The first step in the process for calculating inventory turns and per-unit inventory costs is to
- A) look up the cost of goods from the earnings statement.
 - B) compute inventory turns as $\text{COGS}/\text{inventory}$.
 - C) look up the value of inventory from the balance sheet.
 - D) compute per-unit inventory costs as $\text{annual inventory costs}/\text{inventory turns}$.
 - E) determine the flow rate.

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- 35) The second step in the process for calculating inventory turns and per-unit inventory costs is to
- A) look up the cost of goods from the earnings statement.
 - B) compute inventory turns as COGS/inventory.
 - C) look up the value of inventory from the balance sheet.
 - D) compute per-unit inventory costs as annual inventory costs/inventor turns.
 - E) determine the flow rate.
- 36) The third step in the process for calculating inventory turns and per-unit inventory costs is to
- A) look up the cost of goods from the earnings statement.
 - B) compute inventory turns as COGS/inventory.
 - C) look up the value of inventory from the balance sheet.
 - D) compute per-unit inventory costs as annual inventory costs/inventor turns.
 - E) determine the flow rate.
- 37) The fourth step in the process for calculating inventory turns and per-unit inventory costs is to
- A) look up the cost of goods from the earnings statement.
 - B) compute inventory turns as COGS/inventory.
 - C) look up the value of inventory from the balance sheet.
 - D) compute per-unit inventory costs as annual inventory costs/inventor turns.
 - E) determine the flow rate.
- 38) Reasons for holding inventory include
- A) the time a flow unit spends in the process.
 - B) seasonal demand.
 - C) economies of scale.
 - D) separation of steps in a process.
 - E) All of these are reasons for holding inventory.
- 39) Seasonal inventory occurs when capacity is _____ and demand is _____.
- A) flexible; fixed
 - B) rigid; fixed
 - C) rigid; variable
 - D) flexible; variable
 - E) constrained; constrained

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- 40) The most challenging reason why firms need to maintain inventory is
- A) economies of scale.
 - B) stochastic demand.
 - C) seasonal demand.
 - D) separation of steps in the process.
 - E) time a flow unit spends in a process.
- 41) Based on the product-process matrix, low-volume production is associated with the use of _____ for production.
- A) machine-paced line
 - B) worker-paced line
 - C) batch process
 - D) job shop
 - E) continuous process
- 42) Based on the product-process matrix, very high-volume production is associated with the use of _____ for production.
- A) machine-paced line
 - B) worker-paced line
 - C) batch process
 - D) job shop
 - E) continuous process
- 43) Which of the following best explains why slow turning items may not be profitable at a brick-and-mortar retailer?
- A) If turns are low, days of supply will also be low.
 - B) If turns are low, the gross margin will also be low.
 - C) If turns are low, the setup costs to stock the shelf will be high.
 - D) If turns are low, blocking and starving are more likely to occur.
 - E) If turns are low, units spend a long time on the retailer's shelves.

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- 44) Is it possible for two firms to have the same annual inventory turns and the same gross margin but different days of supply?
- A) Yes, because days of supply measure how long the firm can satisfy demand with its current inventory, whereas inventory turns measure the frequency at which inventory turns over.
 - B) Yes, inventory turns and gross margin are related, but they are independent of days of supply.
 - C) Yes, the firm with the higher days of supply will have the lower return on invested capital.
 - D) No, if firms have the same gross margin, then they must have the same days of supply.
 - E) No, if firms have the same inventory turns, then they must have the same days of supply.
 - F) None of the choices are correct.

SECTION BREAK. Answer all the part questions.

- 45) ProofSmart Incorporated, a supplier of home insulation materials, was burned down in a recent fire. From the remains of what used to be the accounting ledger, the following information was recovered:

	2006	2007
Inventory	\$ 2,367,121	\$ 2,418,257
Gross Margin	42%	45%
Inventory Turns	11	[unreadable]

Prior to the fire, ProofSmart saw a sales growth of 48 percent in 2007, a record performance for the 18-year-old company. (NOTE: Gross margin is defined as $1 - (\text{COGS}/\text{Sales})$.)

- 45.1) What was the sales for 2007?
- Circle the answer closest to the correct answer.
- A) \$318,000
 - B) \$38,000,000
 - C) \$43,000,000
 - D) \$66,000,000
 - E) \$85,000,000
 - F) The answer cannot be determined from the data given.

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45.2) What was the inventory turns for 2007?

Circle the answer closest to the correct answer.

- A) 10
- B) 11
- C) 12
- D) 13
- E) 14
- F) 15
- G) The answer cannot be determined from the data given.

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Answer Key

Test name: Chapter 02

1) FALSE

The graphical representation of activities in a process is called a Gantt chart.

2) TRUE

The definition of a critical path is that it refers to all activities that if delayed would delay the overall completion of a project.

3) FALSE

The number of units contained in a production process is called work in process.

4) TRUE

The amount of time for a unit to get through a process is called flow time.

5) FALSE

The rate at which a process is delivering output is called the throughput rate.

6) FALSE

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The maximum rate at which a process can generate supply is called process capacity.

7) TRUE

The rate at which a process is delivering output is called the throughput rate so if an industry is producing 600 million bottles per year, then this is its throughput rate.

8) TRUE

The flow unit refers to the type of product or service associated with a process so wireless phones are the flow unit of a consumer electronics corporation.

9) TRUE

Shorter flow times reduce the amount of time between the creation of demand and its fulfillment in terms of supply, resulting in better alignment of supply and demand.

10) FALSE

Inventory and flow time are rarely the same value, but they are related to each other as part of Little's Law.

11) TRUE

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This is the correct formula for Little's Law: Average inventory = Average flow rate $\times$ Average flow time.

12) TRUE

In actuality, Little's Law holds true in 100 percent of situations.

13) FALSE

The first step in the process for calculating inventory turns and per-unit inventory costs is to look up the value of inventory from the earnings statement.

14) FALSE

The second step in the process for calculating inventory turns and per-unit inventory costs is to look up the cost of goods sold from the earnings sheet.

15) FALSE

The second step in the process for calculating inventory turns and per-unit inventory costs is to look up the cost of goods sold from the earnings sheet.

16) FALSE

The second step in the process for calculating inventory turns and per-unit inventory costs is to look up the cost of goods sold from the earnings sheet.

17) TRUE

The third step in the process for calculating inventory turns and per-unit inventory costs is to compute inventory turns as cost of goods sold (COGS)/inventory.

18) TRUE

The fourth step in the process for calculating inventory turns and per-unit inventory costs is to compute per-unit inventory costs as annual inventory costs/inventor turns.

19) TRUE

The definition of a pipeline inventory is that it is the basic inventory on which a process operates.

20) FALSE

Seasonal inventory actually occurs when capacity is rigid and demand is variable.

21) TRUE

Scale economies in operations is a key reason why it is beneficial for a firm to maintain inventory.

22) FALSE

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An inventory buffer actually allows management to operate various steps in a process independently of each other which provides flexibility.

23) FALSE

Stochastic demand refers to uncertainty in demand so it is in fact a very relevant and important factor in inventory management.

24) FALSE

Low-volume production is associated with the use of a job shop.

25) FALSE

High-volume production is associated with the use of a continuous process.

26) B

The three key measures of process performance are flow rate, inventory, and flow time.

27) E

A process flow diagram will include inputs, process, and outputs.

28) D

Personal beauty and care products are the things that the supply process is focusing on so they are the flow units.

29) B

Personal beauty and care products are the items that the supply process is focusing on; therefore, they are the flow units.

30) D

Little's Law says that Average inventory = Average flow rate $\times$ Average flow time.

31) B

The formula for flow time is inventory/flow rate.

32) C

The formula for inventory turn is 1/flow time.

33) A

The formula for calculating the per-unit inventory cost is annual inventory cost/annual inventory turns.

34) C

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The first step in the process for calculating inventory turns and per-unit inventory costs is to look up the cost of goods from the balance sheet.

35) A

The second step in the process for calculating inventory turns and per-unit inventory costs is to look up the cost of goods from the earnings statement.

36) B

The third step in the process for calculating inventory turns and per-unit inventory costs is to compute inventory turns as COGS/inventory.

37) D

The fourth step in the process for calculating inventory turns and per-unit inventory costs is to compute per-unit inventory costs as annual inventory costs/inventor turns.

38) E

The five reasons to maintain an inventory include the time a flow unit spends in the process, seasonal demand, economies of scale, separation of steps in a process, and stochastic demand.

39) C

Seasonal inventory occurs when capacity is rigid and demand is variable.

40) B

Stochastic demand is the most challenging reason for the need for inventory because of the uncertainty it brings to the process.

41) D

Low-volume production is associated with the use of a job shop for the production process.

42) E

Very high-volume production is associated with the use of a continuous process for the production process.

43) E

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- b. If turns are low, days of supply will be high.
- c. It is not necessarily true that the gross margin will be low, since various factors affect gross margin.
- d. Setup costs are not affected by turns.
- e. Starving is less likely to occur when turns are low.
- f. Units spend too much time on the shelves, and this will increase the inventory holding cost.

44) E

Knowing inventory turns uniquely specifies days of supply because $\text{inventory turns} = 365/\text{days of supply}$.

45) Section Break

45.1) D

$$2006 \text{ COGS} = 2,367,121 \times 11 = \$26,038,331$$

$$2006 \text{ Sales} = 26,038,331/(1 - 42\%) = \$44,893,674$$

$$2007 \text{ Sales} = 44,893,674 \times 148\% = \$66,442,638$$

45.2) F

$$2007 \text{ COGS} = \$66,442,638 \times (1 - 45\%) = \$36,543,451$$

$$2007 \text{ Inventory Turns} = \$36,543,451/2,418,257 = 15$$