Operations Management 2nd edition Cachon Test Bank

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Operations Management, 2e **(Cachon)**
Chapter 2 Introduction to Processes

1) A flow unit is generally associated with the inputs of a process.

Answer: FALSE
Explanation: A flow unit is generally associated with the outputs of a process.
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Remember
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

2) A process with a high-level scope must have different inputs and outputs than the process viewed at a lower scope.

Answer: FALSE
Explanation: A process scope at a high level can have the same inputs and outputs as one at a lower level.
Difficulty: 3 Hard
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Analyze
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

3) Process metrics measure the level of a process.

Answer: FALSE
Explanation: Process metrics measure the performance and capability of a process.
Difficulty: 1 Easy
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
Learning Objective: 02-02 Distinguish among the three key process metrics (flow rate, flow time, and inventory) and evaluate average flow rate and flow time from departure and arrival data.
Bloom's: Remember
AACSB: Analytical Thinking
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4) The entry rate of inputs and the exit rate of outputs in a process match at every moment.

Answer: FALSE
Explanation: The entry and exit rates do not have to match at every moment, but they do have to match in the long run (i.e., over a long period of time).
Difficulty: 2 Medium
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
Learning Objective: 02-02 Distinguish among the three key process metrics (flow rate, flow time, and inventory) and evaluate average flow rate and flow time from departure and arrival data.
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

5) Little's Law can be used to identify the actual time a particular flow unit spends in a process.

Answer: FALSE
Explanation: Little's Law can be used to identify the average time flow units spend in the process.
Difficulty: 2 Medium
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

6) C&A Bakery serves 200 customers in 10 hours. On average there are five customers in the bakery. This means each customer spends on average 15 minutes in the bakery.

Answer: TRUE
Explanation: Inventory = 5 customers. Flow rate = 200 customers/10 hours = 20 customers per hour. Flow time = Inventory/Flow rate = 5/20 = 0.25 hour, or 15 minutes.
Difficulty: 2 Medium
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Understand
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7) Which of the following statements about a process is TRUE?
A) A process cannot be measured.
B) A process can be measured.
C) A process cannot be improved.
D) A process can only be represented mathematically.

Answer: B
Explanation: There are three key process metrics to measure a process.
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Remember
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

8) Which of the following is a definition of the term "process"?
A) A set of activities that combines a collection of units.
B) A set of activities that combines a collection of supplies.
C) A set of activities that transforms a collection of inputs into outputs.
D) A set of activities that transforms a collection of outputs into inputs.

Answer: C
Explanation: A process is a set of activities that transforms a collection of inputs into outputs.
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Remember
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

9) A graphical representation of a process is called a _____.
A) process flow diagram
B) process flow chart
C) process activity diagram
D) process activity chart

Answer: A
Explanation: A process flow diagram provides a graphical representation of a process.
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Remember
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10) A process scope is the set of _____.
A) resources used in the process
B) outputs produced by the process
C) inputs required by the process
D) activities involved in the process

Answer: D
Explanation: A process scope is the set of activities included in the process.
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Remember
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

11) A CEO of a firm will be interested in a _____ level of the _____ to know how the entire firm is doing.
A) high, process scope
B) high, flow unit
C) low, process scope
D) low, flow unit

Answer: A
Explanation: A CEO wants a high-level picture of his/her company to keep track of how the entire company is doing.
Difficulty: 2 Medium
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
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12) From the perspective of a cashier in a supermarket, the appropriate level for the process scope is _____.
A) the customer checkout process
B) the supermarket
C) the grocery business
D) the food industry

Answer: A
Explanation: A cashier is responsible for the customer checkout process in a supermarket.
Difficulty: 2 Medium
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

13) A flow unit is the basic unit that _____.
A) activates a process
B) goes into a process
C) bypasses a process
D) moves through a process

Answer: D
Explanation: A flow unit is the basic unit that moves through a process.
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
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14) An example of a flow unit at a fast-food restaurant is the _____.
A) cashiers
B) kitchen
C) customers
D) suppliers

Answer: C
Explanation: Customers move through a fast-food restaurant. The others are inputs and resources of the fast-food service.
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
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15) For the purpose of process analysis, what is an appropriate flow unit to analyze the main operation of a department store?
A) Number of hours the store is open each day
B) Square footage of the store
C) Weekly sales figure
D) Number of cash registers

Answer: C
Explanation: Weekly sales figure is measured in sales dollars, which is an appropriate flow unit.
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Remember
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16) For the purpose of process analysis, what is NOT an appropriate flow unit to analyze the operation of a hair salon?
A) Number of customers served per day
B) Monthly sales figures
C) The dollar value of haircare products sold per day
D) Number of stylists working each day

Answer: D
Explanation: Stylists are input resources of a hair salon.
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
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17) Which of the following statements about a process flow diagram is FALSE?
A) It cannot have multiple resources.
B) It includes inputs, resources, and outputs.
C) It has inputs flowing into a process.
D) It has outputs flowing out of a process.

Answer: A
Explanation: A process flow diagram can have multiple resources, with the outputs of some resources used as inputs to other resources.
Difficulty: 2 Medium
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Understand
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18) Which of the following statements about resources of a process flow diagram is TRUE?
A) Resources are outputs of a process.
B) Resources are represented as arrows pointing to a process.
C) Resources are not relevant to a process.
D) Outputs of some resources can be inputs to other resources.

Answer: D
Explanation: A process flow diagram can have multiple resources with the output of some resources used as inputs to other resources.
Difficulty: 2 Medium
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Understand
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19) Which of the following is an appropriate output of a refreshment stand at a cinema?
A) Corn
B) Popcorn
C) Ticket sales
D) Movies

Answer: B
Explanation: A refreshment stand in a cinema transforms corn (inputs) into popcorn (outputs).
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
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20) Which of the following is the most appropriate output of a cinema?
A) Corn
B) Movie screens
C) Ticket sales
D) Candy bars

Answer: C
Explanation: A cinema sells tickets to moviegoers.
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Remember
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21) Which of the following is an appropriate input of a bakery?
A) Steel beam
B) Baked goods
C) Oven
D) Flour

Answer: D
Explanation: A bakery takes in flour, milk, eggs, etc. (inputs) and produces baked goods (outputs).
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
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22) Which of the following is an appropriate output of a bakery?
A) Steel beam
B) Baked goods
C) Oven
D) Flour

Answer: B
Explanation: A bakery takes in flour, milk, eggs, etc. (inputs) and produces baked goods (outputs).
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Remember
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23) Which of the following is an appropriate resource of a bakery?
A) Steel beam
B) Baked goods
C) Oven
D) Flour

Answer: C
Explanation: An oven is a piece of equipment (resource) in a bakery.
Difficulty: 2 Medium
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Understand
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Accessibility: Keyboard Navigation; Screen Reader Compatible

24) Which of the following is measured in an appropriate flow unit for a cinema?
A) Corn
B) Popcorn
C) Ticket sales
D) Candy bars

Answer: C
Explanation: Ticket sales is measured in sales dollars, which is an appropriate flow unit for a cinema.
Difficulty: 2 Medium
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
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25) Which of the following is an appropriate resource of a cinema?
A) Movie projector
B) Popcorn
C) Ticket sales
D) Number of customers

Answer: A
Explanation: A movie projector is a piece of equipment in a cinema.
Difficulty: 2 Medium
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Understand
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26) Which of the following is NOT a rule to define a flow unit?
A) A flow unit should correspond to what is tracked and measured in a process.
B) A flow unit should be measured consistently in the unit for which it is defined.
C) A flow unit should be used to measure all activities within a process.
D) A flow unit should be used to measure the number of resources in a process.

Answer: D
Explanation: A flow unit should be used to measure all activities within a process in the unit for which it is defined.
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
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27) Which of the following measures is an appropriate flow unit for analyzing the main operation of a supermarket?
A) Number of customers served
B) Number of square feet in the store
C) Number of checkout lines
D) Number of employees

Answer: A
Explanation: Customers flow through the process of a supermarket.
Difficulty: 2 Medium
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Understand
AACSB: Analytical Thinking
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28) Which of the following are NOT appropriate flow units to analyze the main operation of a supermarket?
A) Customers served and the number of employees working per day
B) Sales dollars and the number of employees working per day
C) Sales dollars and customers served
D) Number of registers and number of employees working per day are input resources

Answer: D
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
Bloom's: Remember
AACSB: Analytical Thinking
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29) A flow unit is generally associated with the _____ of a process.
A) inputs
B) resources
C) outputs
D) activities

Answer: C
Explanation: A flow unit is generally associated with the outputs of a process.
Difficulty: 1 Easy
Topic: Process Definition, Scope, and Flow Units
Learning Objective: 02-01 Identify an appropriate flow unit for a process.
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30) A process metric is something that can be _____ to reveal the _____ and _____ of a process.
A) measured, inputs, outputs
B) measured, performance, capability
C) speculated, inputs, outputs
D) speculated, performance, capability

Answer: B
Explanation: A process metric is something that can be measured to reveal the performance and capability of a process.
Difficulty: 1 Easy
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
Learning Objective: 02-02 Distinguish among the three key process metrics (flow rate, flow time, and inventory) and evaluate average flow rate and flow time from departure and arrival data.
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31) A key process metric is _____.
A) flow rate
B) flow unit
C) base unit
D) base rate

Answer: A
Explanation: Flow rate is one of the three key process metrics.
Difficulty: 1 Easy
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
Learning Objective: 02-02 Distinguish among the three key process metrics (flow rate, flow time, and inventory) and evaluate average flow rate and flow time from departure and arrival data.
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32) A key process metric is _____.
A) raw materials
B) inputs
C) inventory
D) outputs

Answer: C
Explanation: Inventory is one of the three key process metrics.
Difficulty: 1 Easy
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
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Bloom's: Remember
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33) A key process metric is _____.
A) activity time
B) process time
C) completion time
D) flow time

Answer: D
Explanation: Flow time is one of the three key process metrics.
Difficulty: 1 Easy
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
Learning Objective: 02-02 Distinguish among the three key process metrics (flow rate, flow time, and inventory) and evaluate average flow rate and flow time from departure and arrival data.
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34) Which of the following is NOT a key process metric?
A) Flow unit
B) Flow time
C) Flow rate
D) Inventory

Answer: A
Explanation: The three key process metrics are inventory, flow rate, and flow time.
Difficulty: 1 Easy
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
Learning Objective: 02-02 Distinguish among the three key process metrics (flow rate, flow time, and inventory) and evaluate average flow rate and flow time from departure and arrival data.
Bloom's: Remember
AACSB: Analytical Thinking
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35) Flow rate tells us _____.
A) how much stuff is in the process
B) how much stuff moves through the process per time unit
C) how much time stuff spends in the process
D) how much stuff is needed for the process

Answer: B
Explanation: Flow rate tells us how much stuff moves through the process per unit of time.
Difficulty: 1 Easy
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
Learning Objective: 02-02 Distinguish among the three key process metrics (flow rate, flow time, and inventory) and evaluate average flow rate and flow time from departure and arrival data.
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36) Flow time tells us _____.
A) the number of flow units within a process
B) the rate at which a flow unit moves through a process
C) the time a flow unit spends in a process
D) the time at which a flow unit starts a process

Answer: C
Explanation: Flow time tells us how much time stuff spends in the process.
Difficulty: 1 Easy
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
Learning Objective: 02-02 Distinguish among the three key process metrics (flow rate, flow time, and inventory) and evaluate average flow rate and flow time from departure and arrival data.
Bloom's: Remember
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37) Inventory tells us _____.
A) the number of flow units within a process
B) the rate at which flow units move through a process
C) the time a flow unit spends in a process
D) the time at which a flow unit starts a process

Answer: A
Explanation: Inventory tells us how much stuff is in the process.
Difficulty: 1 Easy
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
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38) Which of the following pieces of information is needed to compute flow time at a dentist's office?
A) Traveling time of patients
B) Scheduling time of patients
C) Arrival time of patients
D) Arrival time of staff

Answer: C
Explanation: Arrival and departure times are needed to compute the flow time.
Difficulty: 2 Medium
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
Learning Objective: 02-02 Distinguish among the three key process metrics (flow rate, flow time, and inventory) and evaluate average flow rate and flow time from departure and arrival data.
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39) Arrivals and departures to C&A Optometrist are collected and reported below:

Patient	Arrival	Departure
1	7:45	8:45
2	8:00	9:00
3	10:00	10:30
4	10:15	11:45
5	10:35	12:00

What is the average flow time of its patients in minutes?
A) 90
B) 65
C) 63
D) 60

Answer: B
Explanation: Subtract each customer's departure time from the arrival time to give the flow time for each customer. For example, patient 1 spends 60 minutes. The flow times for the five patients are 60, 60, 30, 90, and 85. The average flow time is found by dividing total flow time by five patients, 325/5 = 65 minutes.
Difficulty: 2 Medium
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
Learning Objective: 02-02 Distinguish among the three key process metrics (flow rate, flow time, and inventory) and evaluate average flow rate and flow time from departure and arrival data.
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40) Arrivals and departures to C&A Optometrist are collected and reported below:

Patient	Arrival	Departure
1	7:45	8:45
2	8:00	9:00
3	10:00	10:30
4	10:15	11:45
5	10:35	12:00

Assume C&A Optometrist is open from 7:45 a.m. to noon. What is the flow rate of patients in C&A Optometrist per hour?
A) 1.18
B) 0.85
C) 1
D) 5

Answer: A
Explanation: The optometrist is open from 7:45 a.m. to noon, or 4.25 hours. There are five patients during that time. Flow rate in patients per hour = 5/4.25 = 1.18.
Difficulty: 2 Medium
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
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41) C&A Bakery serves 100 customers over the course of an 8-hour day. What is the flow rate of customers in this bakery per hour?
A) 10
B) 4.8
C) 12.5
D) 13

Answer: C
Explanation: Flow rate = 100 customers/8 hours = 12.5 customers per hour.
Difficulty: 2 Medium
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
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42) Ten customers visit C&A Bakery from 8 a.m. to 10 a.m. The customers spend 10, 15, 20, 11, 8, 12, 5, 18, 29, and 32 minutes in the bakery. What is the average flow time (in minutes) of a customer at this bakery?
A) 12
B) 160
C) 80
D) 16

Answer: D
Explanation: Average flow time is (10 + 15 + 20 + 11 + 8 + 12 + 5 + 18 + 29 + 32)/10 = 16 minutes.
Difficulty: 2 Medium
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
Learning Objective: 02-02 Distinguish among the three key process metrics (flow rate, flow time, and inventory) and evaluate average flow rate and flow time from departure and arrival data.
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43) Ten customers visit C&A Bakery from 8 a.m. to 10 a.m. The customers spend 10, 15, 20, 11, 8, 12, 5, 18, 29, and 32 minutes in the bakery. What is the average flow rate of customers in this bakery per hour?
A) 16
B) 10
C) 12
D) 5

Answer: D
Explanation: Flow rate = 10 customers/2 hours = 5 customers per hour.
Difficulty: 2 Medium
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
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44) The flow rate of customers at a state fair is 100 per hour. The fair is open from 8 a.m. to 8 p.m. How many customers come through the fair during that time?
A) 1000
B) 1200
C) 120
D) 100

Answer: B
Explanation: Number of customers = 100 customers per hour × 12 hours = 1200.
Difficulty: 2 Medium
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
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45) Flow rate is usually measured in the following units EXCEPT _____.
A) dollars per week
B) pounds per month
C) boxes per week
D) dollars per customer

Answer: D
Explanation: Flow rate is measured in "flow units per unit of time."
Difficulty: 1 Easy
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
Learning Objective: 02-02 Distinguish among the three key process metrics (flow rate, flow time, and inventory) and evaluate average flow rate and flow time from departure and arrival data.
Bloom's: Remember
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

46) Inventory is usually measured in the following units EXCEPT _____.
A) hours
B) dollars
C) pounds
D) boxes

Answer: A
Explanation: Inventory is usually a physical measurement associated with the flow unit.
Difficulty: 1 Easy
Topic: Three Key Process Metrics: Inventory, Flow Rate, and Flow Time
Learning Objective: 02-02 Distinguish among the three key process metrics (flow rate, flow time, and inventory) and evaluate average flow rate and flow time from departure and arrival data.
Bloom's: Remember
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47) Arrivals and departures to C&A Optometrist are collected and reported below:

Patient	Arrival	Departure
1	7:45	8:45
2	8:00	9:00
3	10:00	10:30
4	10:15	11:45
5	10:35	12:00

Assume C&A Optometrist is open from 7:45 a.m. to noon. How many patients on average are in C&A Optometrist?
A) 0.85
B) 1.27
C) 1.08
D) 4.25

Answer: B
Explanation: Flow rate in patients per hour = 5 / 4.25 = 1.18. Flow time is 1.08 hours. Using I = RT, average number of patients is 1.08 × 1.18 = 1.27.
Difficulty: 3 Hard
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Analyze
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

48) Which of the following factors is relevant to Little's Law?
A) Customer arrival times
B) Resource input time
C) Customer sequencing
D) Average flow time

Answer: D
Explanation: Because Little's Law is dealing with the average number of units in the process, the only relevant factors are the average flow rate and average flow time.
Difficulty: 2 Medium
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Understand
AACSB: Analytical Thinking
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49) Both the average flow rate and average flow time of a process are increased by 50%. What will be the percentage change in the average number of units in the process?
A) 225%
B) 125%
C) 50%
D) 25%

Answer: B
Explanation: Assume inventory before the change is 1 (or any other number that you prefer). Flow rate = 1, Flow time = 1. Inventory after the change = 1.5 × 1.5 = 2.25. Therefore, inventory increases by 1.25 units, which is 1.25/1 = 125% of the original amount.
Difficulty: 3 Hard
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Analyze
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

50) Each of these is a metric in Little's Law EXCEPT _____.
A) flow rate
B) flow unit
C) flow time
D) inventory

Answer: B
Explanation: Little's Law relates inventory as the product of flow rate and flow time.
Difficulty: 1 Easy
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Remember
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51) Little's Law relates inventory, flow rate, and flow time as _____.
A) Inventory = Flow rate + Flow time
B) Inventory = Flow rate − Flow time
C) Inventory = Flow rate × Flow time
D) Inventory = Flow rate/Flow time

Answer: C
Explanation: Little's Law gives the relationship as Inventory = Flow rate × Flow time.
Difficulty: 1 Easy
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Remember
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

52) Ten customers visit C&A Bakery from 8 a.m. to 10 a.m. The customers spend 10, 15, 20, 11, 8, 12, 25, 18, 29, and 32 minutes in the bakery. On average, how many customers are in the bakery from 8 a.m. to 10 a.m.?
A) 18
B) 10
C) 1.5
D) 0.83

Answer: C
Explanation: Average flow time is (10 + 15 + 20 + 11 + 8 + 12 + 25 + 18 + 29 + 32)/10 = 18 minutes. Average flow rate = 10 customers/120 minutes = 1/12 customer per minute. Inventory = 1.5 customers.
Difficulty: 3 Hard
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Analyze
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53) On average, a patient spends 5 minutes waiting and 15 minutes being treated at C&A Clinic. The average number of patients waiting and being treated at the clinic is 50. What is the average flow rate of patients per minute on a typical day?
A) 2.5
B) 20
C) 50
D) 0.5

Answer: A
Explanation: Average flow rate = 50 patients/(5 + 15) minutes = 2.5 patients per minute.
Difficulty: 2 Medium
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

54) A drive-through at C&A Fast Food serves 300 customers over a 10-hour day. On average, a customer spends 2 minutes waiting in line, 3 minutes placing the order, and 5 minutes completing the order before leaving the drive-through. How many customers on average are "in" the drive-through (i.e., from the time they enter to the time they exit the drive-through) on a typical day?
A) 10
B) 300
C) 30
D) 5

Answer: D
Explanation: Flow rate = 300 customers/(10 × 60) minutes = 0.5 customer per minute. Flow time = (2 + 3 + 5) minutes = 10 minutes. Inventory = 0.5 customer per minute × 10 minutes = 5 customers.
Difficulty: 3 Hard
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Analyze
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55) C&A Cruise owns 10 ships and wants to serve 2000 passengers each week. Each cruise ship can carry 500 passengers on each voyage. Assume ships always travel fully loaded. What is the longest average travel time on a voyage that allows C&A Cruise to meet its goal of serving 2000 passengers per week?
A) 4 weeks
B) 2.5 weeks
C) 1 week
D) 5 weeks

Answer: B
Explanation: Inventory with all ships on a voyage = 10 × 500 passengers = 5000 passengers. Desired flow rate = 2000 passengers per week. I = R × T, thus T = I/R. Flow time = 5000 passengers/2000 passengers per week = 2.5 weeks.
Difficulty: 3 Hard
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Analyze
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

56) C&A uses 1200 pounds of milk per day to make ice cream. On average, C&A uses 12 pounds of milk to make one gallon of ice cream in 4 hours. How many gallons of ice cream are being made on average at any one time if C&A operates for 8 hours a day?
A) 25
B) 50
C) 100
D) 120

Answer: B
Explanation: Flow rate = 1200 pounds per day/12 pounds of milk per gallon = 100 gallons of ice cream per day. Flow time = 4 hours/8 hours a day = 0.5 day. Inventory = 100 gallons × 0.5 day = 50 gallons.
Difficulty: 3 Hard
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Analyze
AACSB: Analytical Thinking
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57) C&A uses 1200 pounds of milk per day to make ice cream. On average, C&A uses 12 pounds of milk to make one gallon of ice cream. The production process takes 2 hours of mixing and 2 hours of cooling. How many gallons of ice cream does the cooler hold on average at any one time (i.e., consider only the flow time for cooling) if C&A operates for 8 hours a day?
A) 25
B) 50
C) 100
D) 120

Answer: A
Explanation: Flow rate = 1200 pounds per day/12 pounds of milk per gallon = 100 gallons of ice cream per day. Flow time = 2 hours/8 hours a day = 0.25 day. Inventory = 100 gallons × 0.25 day = 25 gallons.
Difficulty: 3 Hard
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Analyze
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

58) Twenty new members are elected to an agency every two years. The agency has 100 members on average overall. How long does a member hold his/her position at the agency?
A) 50 years
B) 20 years
C) 10 years
D) 5 years

Answer: C
Explanation: Inventory = 100 members. Flow rate = 20/2 = 10 new members per year. I = R × T, therefore T = I/R. Flow time = 100/10 = 10 years.
Difficulty: 3 Hard
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Analyze
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59) C&A Museum has three million visitors per year. Each visitor spends an average of 1 hour in the museum. What is the average number of visitors in the museum on a given day if the museum is open 300 days a year from 9 a.m. to 5 p.m.?
A) 1250
B) 2400
C) 7500
D) 8000

Answer: A
Explanation: Flow rate = 3,000,000 visitors/(300 × 8) hours = 1250 visitors per hour. Flow time = 1 hour. Inventory = R × T = 1250 × 1 = 1250 visitors.
Difficulty: 3 Hard
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Analyze
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

60) A clinical trial accepts 3000 new patients each month. Half of the patients are taking a placebo for 6 months. How many patients are taking the placebo on average at any given time?
A) 18,000
B) 9000
C) 3000
D) 1500

Answer: B
Explanation: Flow rate = 3000 / 2 = 1500 patients per month. Flow time = 6 months. Inventory = R × T = 1500 × 6 = 9000.
Difficulty: 3 Hard
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Analyze
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61) A popular roller coaster ride lasts 10 minutes. There are 20 people on average on the roller coaster during peak time. How many people are stepping onto the roller coaster per minute at peak time?
A) 2
B) 5
C) 10
D) 20

Answer: A
Explanation: Flow time = 10 minutes. Inventory = 20. I = R × T, therefore R = I / T. Flow rate = 20 / 10 = 2 people per minute.
Difficulty: 2 Medium
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation; Screen Reader Compatible

62) McKinley, a large consulting firm in the UK, has a consulting staff consisting of 400 consultants at the rank of "associate." On average, a consultant remains at the associate level for 2 years. After this time, 30% of the consultants are promoted to the rank of "engagement manager"; the other 70% have to leave the company. In order to maintain the consulting staff at an average level of 400 associates, how many new consultants does McKinley have to hire each year at the associate level?
A) 100 associates/year
B) 200 associates/year
C) 300 associates/year
D) 400 associates/year

Answer: B
Explanation: Use I = R × T. I, or inventory, is 400. T, or flow time, is 2 years. Solving for R, or flow rate, McKinley should hire 400/2 = 200 associates per year.
Difficulty: 3 Hard
Topic: Littles Law—Linking Process Metrics Together
Learning Objective: 02-03 Use Little's Law to evaluate the three key process metrics.
Bloom's: Apply
AACSB: Reflective Thinking
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