

MgtOp 340—Operations Management
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Sample Final Exam

1. Why do the Japanese use the ocean water as a symbol of inventory?
 - A. It hides problems.
 - B. It allows for “smooth sailing” of the operation in the long run.
 - C. Inventory is always present (i.e., it never “dries up”).
 - D. Inventory always gets replenished (like rain falling on the ocean).
2. Which country has the most widespread and formal apprenticeship system?
 - A. Sweden
 - B. Japan
 - C. Germany
 - D. Taiwan
 - E. South Korea
3. A manufacturer of pharmaceutical products has 4 distribution centers at the location coordinates below. The yearly demand at each center is also given. Management has decided to build a new plant at a “central” location. What should be the map coordinates of the new plant?

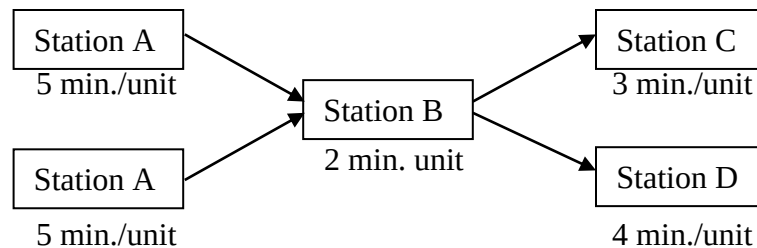
<u>Distribution Center</u>	<u>(x,y) Coordinates</u>	<u>Demand</u>
A	(30, 120)	8,000
B	(60, 40)	10,000
C	(80, 100)	5,000
D	(90, 60)	4,000

- A. (65, 80)
 - B. (54.63, 72.12)
 - C. (60, 79)
 - D. (59.26, 77.78)
 - E. (60, 60)
4. What is the *load-distance* score for a location at coordinates (4, 16) shipping 100 units to a customer at (7, 12) and 300 units to a customer at (4, 20)? Assume Euclidean distance.
 - A. 1900
 - B. 1465
 - C. 1700
 - D. 1300
 - E. 865

5. Suppose that a plant manager has taken MgtOp 340, and so she uses economic batch sizes for production of a product. Suppose further that the setup cost is \$50, the holding cost per unit per year is \$10, the annual demand is 30,000 units, the firm operates (and experiences demand) 300 days per year, and the production rate per day is 1000 units. What will be the maximum inventory level that this product ever reaches?

A. 577
B. 30
C. 519
D. 27,000
E. 58

6. Consider the assembly line shown below. The two Station A processes run in parallel. What is the bottleneck time of the system?



A. 5 min./unit
B. 2 min./unit
C. 4 min./unit
D. 11 min./unit
E. 7 min./unit
F. 15 min./unit

7. What is the rectilinear distance between (20, 65) and (32, 55)?

A. 15.62
B. 244
C. 4.69
D. 22
E. 2

8. Which of the following suppliers would be best able to provide JIT delivery?

A. One with low fixed costs to set up new plants.
B. One with significant production economies of scale.
C. One with excellent outbound freight scheduling software.
D. One who is delivering heavy, bulky products.

9. Suppose that Jane's company uses exponential smoothing to make forecasts. Further suppose that last period's demand forecast was for 500 units, and last period's actual demand was 480 units. Jane's company uses an alpha value of .20. Today Jane's boss asked her to prepare a forecast for this period. What should that forecast be?
- A. 504
B. 496
C. 510
D. 484
E. 550
10. Which of the following is not a remedy for the "Bullwhip Effect?"
- A. Allocate units based on past demand.
B. Price stabilization.
C. Base forecasts on demand coming from the immediate downstream customer.
D. Channel coordination.
E. Information sharing.
11. Which of the following is not an assumption of the Basic Economic Order Quantity (EOQ) model?
- A. Infinite time horizon.
B. A shortage can be filled after the next order comes in.
C. Demand is known with certainty.
D. There is no inflation.
E. The order size can be larger than the annual demand.
12. The items listed below are stored in a one-dock warehouse. Which of them should be stored at the very back (furthest away from the dock)?

<u>Item</u>	<u>Trips</u>	<u>Area Needed (blocks)</u>
Star Trek videos	2000	5
Ballet videos	5	1
Tom Cruise videos	200	2
Simpson videos	1000	2
Operations Management videos	500	1

- A. Star Trek videos
B. Ballet videos
C. Tom Cruise videos
D. Simpson videos
E. Operations Management videos

13. Which type of facility layout is most like an assembly line?
- A. Product layout
 - B. Process layout
 - C. Warehouse layout
 - D. Fixed position layout
14. Suppose that Joey Joe Joe wants to use a process control chart to monitor the number of different types of mistakes that he makes when giving motivational speeches to student groups. Which type of control chart would be most appropriate?
- A. z chart
 - B. Q chart
 - C. p chart
 - D. c chart
 - E. R chart
 - F. $\bar{x}$ -bar chart
15. What is the mean absolute deviation of the following forecasts?

<u>Month</u>	<u>Actual Sales</u>	<u>Forecast</u>
Jan.	614	600
Feb.	480	480
Mar.	500	550
Apr.	500	600

- A. 3174
 - B. 12,696
 - C. 41
 - D. 136
 - E. -34
16. The jobs listed below needed to be completed. Assume that it is now day 140.

<u>Job</u>	<u>Processing Time (days)</u>	<u>Due Date</u>
A	20	180
B	30	200
C	10	175
D	16	230
E	18	210

If the jobs are sequenced according to shortest processing time rule, what is the *average completion time*?

- A. 47.6
- B. 60.2
- C. 94.0
- D. 2.5
- E. 238.0

17. Given the data from question 18, if the jobs are sequenced according to the longest processing time rule, what is the *lateness* of job A?
- A. 0
 - B. 24
 - C. 7.4
 - D. 10
 - E. 11.6
 - F. 9
18. If it takes 60 hours to produce the first unit of a product and 50 hours to produce the 9th unit, what is the learning rate?
- A. 150%
 - B. 94.4%
 - C. 59.2%
 - D. 83.3%
 - E. 66.99%
19. If it took 100 hours to produce the first unit of a product, and the learning rate is 70%, how long will it take to produce units 26 through 125?
- A. 1158.54 hours
 - B. 1998.94 hours
 - C. 1779.07 hours
 - D. 10,000 hours
 - E. Impossible to answer in the time allowed.
20. If firm A has an initial production cost of \$100 and a learning rate of 75%, while firm B has an initial production cost of \$80 and a 50% learning rate, which of the following is true?
- A. The production cost for firm A will never be less than that of firm B.
 - B. The second unit of product B costs \$79.50.
 - C. After 5000 units, the product cost will be the same for both companies.
 - D. After 9 months, the cost for firm A is \$50.00.
21. Consider a periodic review system and suppose that it is time to review the item. On-hand inventory equals 700 units, there is a backorder for 300 units, and there is a scheduled receipt for 800 units. If the target inventory is 2000 units, how many units should be ordered?
- A. 2000
 - B. 1200
 - C. 0
 - D. the EOQ amount
 - E. 800

22. Cans of soup are supposed to weigh exactly 16 oz. Inspectors want to develop process control charts. They take eight samples of five boxes and weigh them. They obtain the following data:

<u>Sample</u>	<u>Mean</u>	<u>Range</u>
1	15.2	1.8
2	14.6	0.7
3	16.5	0.5
4	18.1	0.4
5	13.2	0.2
6	16.0	0.4
7	15.9	0.5
8	14.8	0.9

What is the upper control limit for the R chart?

- A. 15.93
B. 15.15
C. 0
D. 2.28 F. 1.26
E. 2.01 G. 1.43
23. Five jobs must be scheduled. Each of the jobs must be processed on two machines (A and B) in the same order. The processing times are listed below. In what order should the jobs be processed?

<u>Job</u>	<u>A</u>	<u>B</u>
1	16	2
2	10	10
3	3	4
4	2	20
5	1	12

- A. 1-2-3-4-5
B. 3-5-2-4-1
C. 4-5-3-2-1
D. 4-1-2-3-5
E. 5-4-3-2-1