ction 1: General

1. The exponential smoothing model produces a naïve forecast when the smoothing constant, alpha, is equal to

C

   a. 2.00
   b. 0.50
   c. 1.00
   d. 0.00

2. The demand for an electronic component is normally distributed with an average daily demand of 500 units and a standard deviation of 50. The lead-time for the component is 9 days.2. If a service level of 95% is desired, then the company's safety stock for this component is approximately

σ 1.65 × 50 × 3

C

   a. 336 units
   b. 150 Units
   c. 247 Units
   d. 740 units

3. Forecast methods based on judgment, opinion, past experiences, or best guesses are known as _____ methods.

B

   a. Quantitative
   b. Qualitative
   c. Regression
   d. Time Series

4. The closer the smoothing constant, alpha, is to 1.0 the

If more value of alpha, then more reactive to variations in recent demand and less smoothing or dampening will occur => B

   a. more accurate the forecast.
   b. greater the reaction to the most recent demand.
   c. less accurate the forecast.
   d. greater the dampening, or smoothing, effect.

5. If the limits of the control chart are set at 3 sigma on either side of the centre line and the distribution of the variable being monitored is normal, the probability of type II error is

c => we want the measured mean for calculating type II error.

   a. 0.27
   b. 0.027
   c. Can't say
   d. 0.0027

6. If the limits of the control chart are set at 3.1 sigma on either side of the centre line and the distribution of the variable being monitored is normal, the probability of type I error is

remaining area => b

   a. 0.00006
   b. 0.0019
   c. 0.0027
   d. can't say

7. Which of the following is not a forecasting method

b ; Product diffusion curves or technology diffusion curves are in quantitative forecasting methods...

   a. Technology diffusion curves
   b. Back casting
   c. Associative
   d. Time series

8. The Sales and Operations planning falls in which of the following categories

short to middle range planning => tactical

   a. None of the above
   b. Startegic planning
   c. Tactical Planning
   d. Operational planning

9. Which of the following is not an assumption of the EOQ model?

   a. demand rate is known and constant
   b. order quantity is received all at once
   c. lead time is constant

d => shortages are not allowed in EOQ model.

Common Cause Variation refers to the natural variability that is inherent in a process and is typically predictable within certain limits. This type of variation is caused by factors that are consistently present in the process and can be managed through process improvement efforts. On the other hand, Special Cause Variation is caused by factors that are not consistently present in the process and can lead to unpredictable and significant changes in output. Special Cause Variation requires immediate attention and investigation to identify and eliminate the root cause of the variation. Both types of variation are important to understand and manage in order to improve the overall performance of a process.

d. shortages are allowed

10. The sum of the weights in a weighted moving average forecast must
    a. EQUAL 1.00.
    b. Be Less Then 1.00.
    c. Be Greater Then 1.00.
    d. Equal the number being averaged

a

11. Which of the following statements about the ABC classification system are true: a) It is a method for classifying inventory based on the percentage of total value and the percentage of total quantity. b) Class A items in the ABC classification system require less monitoring and control than Class C items. c) It is useful in rationing monitoring capability. d) It is useful in determining EOQ.
    a. b and d
    b. a and c
    c. a and b
    d. c and d

b => Statement written in (c) is written by sir in class..

12. BWE manifests as distortions in _____ of the demand signal as it propagates upstream:
    a. Both
    b. None
    c. Phase Angle
    d. Amplitude

a

13. Select the correct order of steps involved in ABC Classification given below: i. Evaluate cumulative %age value and quantity across rows ii. Sort in descending order the table along the column containing the total value iii. List the inventories items, their cost and quantity iv. Evaluate %age of total value and total quantity for each row
    a. iii, i, iv, ii
    b. i, ii, iii, iv
    c. iii, ii, iv, i
    d. ii, iv, i, iii

c

14. The demand for an electronic component is normally distributed with an average daily demand of 500 units, and a standard deviation of 50. The lead time for the component is 9 days. If the company sets a reorder point of 4,650 for this component then its service level is approximately
    a. 92 percent
    b. 84 percent
    c. 50 percent
    d. 98 percent

b

$4650 = 9 \times 500 + 2 \times 50 \times 3$

15. What is the correct hierarchy of the planning activities in descending order of planning horizon:
    a. Aggregate Production Planning, Capacity Expansion, Capacity Requirement Planning, Scheduling.
    b. Capacity Expansion, Aggregate Production Planning, Capacity Requirement Planning, Scheduling.
    c. Capacity Requirement Planning, Capacity Expansion, Aggregate Production Planning, Scheduling.
    d. Scheduling, Capacity Expansion, Aggregate Production Planning, Capacity Requirement Planning.

b => according to the planning horizon.
Capacity expansion is a long term strategic decision.

16. The extent to which the firm will produce the inputs and control the outputs of each stage of the production process is known as:
    a. vertical integration
    b. capital intensity.
    c. process flexibility
    d. process planning

a

17. How many feedback loops are there in the flowchart of the forecasting process:
    a. 2

a => model selection and monitoring.

b. 0
c. 1
d. 3

18. In supply chain management, what does the term "capital intensity" refer to?
    a. The cost of raw materials and inventory
    b. The expenses associated with employee salaries and benefits
    c. The amount of money required for marketing strategies
    d. The level of financial investment in production equipment and technology

d

19. Which of the following statements is not correct:
    a. Upper and lower limits on the control chart are fixed numbers and not multiples of standard deviation of the error.
    b. Upper and lower limits on the tracking signal chart are fixed numbers and not multiples of its standard deviation.
    c. Control chart is used for monitoring of forecasts
    d. Tracking signal is used to monitor forecasts

a => in control charts, limits are 3sigma.

20. The demand for an electronic component is normally distributed with an average daily demand of 500 units and a standard deviation of 50. The lead-time for the component is 9 days.If a service level of 95% is desired then the company's reorder point for this component is approximately
    a. 4627 units
    b. 3785 Units
    c. 4500 Units
    d. 4747 units

d

21. Which of the following topics related to O&SCM was not covered in the course in detail:
    a. Production Planning
    b. Inventory
    c. BWE
    d. SPC

d

22. For the demand values and the January forecast shown in the table below the exponential smoothing forecast for March using alpha = 0.30 is Period, Demand, Forecast, January 500 480 February 476 (Demand) March 503 (Demand) April
    a. 483
    b. 480
    c. 489
    d. 486

a

23. Which of the following is not an assumption of the EOQ model?
    a. order quantity is received all at once
    b. shortages are allowed
    c. lead time is constant
    d. demand rate is known and constant

b

24. The underlying rational for ABC classification scheme for inventory control is (Choose only 1 option)
    a. Rationing of monitoring capability
    b. Excellence
    c. Redundancy
    d. Speed

a

25. Which of the following is not a variable in production planning
    a. Sub-Contracting
    b. Overtime
    c. Inventory
    d. Capital Investment

d => capital investment is related to strategic objectives planning and hence, not part of tactical planning.

26. The sum of the weights in a weighted moving average forecast must
    a. Be Greater Then 1.00
    b. Equal the number being averaged

d

The characteristic that does not reflect common cause variation is trend.
Common cause variation refers to the random variation that is inherent in a process and is due to common sources within the system. It is typically short-term, stable, predictable, and not easily changed. Trend, on the other hand, refers to a systematic shift or movement in data over time that is not random and is attributed to a special cause variation.
In the context of statistical process control, common cause variation is also known as random variation, while special cause variation is referred to as assignable variation. Random variation is a natural part of any process and can be managed through process improvement techniques, while assignable variation requires investigation and intervention

c. Be Less Then 1.00.
d. EQUAL 1.00.

27. Fundamental problem of O&SCM is a) Demand and supply are not collocated b) Demand and supply are coincidental in time c) Demand and supply are not coincidental in time d) Demand and supply are not relevant
   a. c and d
   b. All Of The Above
   c. b and d
   d. a and c

d => demand (customer needs) and supply (available goods and services) are often not located in the same place or not available at the same time.

28. The demand for an electronic component is normally distributed with an average daily demand of 500 units and a standard deviation of 50. The lead-time for the component is 9 days.If a service level of 95% is desired then the company's reorder point for this component is approximately
   a. 4747 units
   b. 4500 Units
   c. 4627 units
   d. 3785 Units

a

$d = 500$
$\sigma_d = 50$
$L = 9$
$z = 1.65$

29. Which of the following statements are not true about variation in business processes:
   a. Random variation and common cause variation refer to same phenomena.
   b. Special cause variation is same as Assignable cause variation.
   c. Common cause variation is said to be prevalent when an attributable cause can be identified.
   d. Variation in demand is structural

c => CCV doesn't have an assignable cause.

30. Which of the following statements is true for demand per period which is independent and normally distributed
   a. The variance for the aggregate demand during the lead time is the sum of the demand per period.
   b. The variance for the aggregate demand during the lead time is the product of the demand per period.
   c. The standard deviation for the aggregate demand during the lead time is the sum of the demand per period.
   d. The standard deviation for the aggregate demand during the lead time is the product of the demand per period.

a

31. The daily demand for a product is normally distributed with a mean value of 100 and the variance of 25, what is the probability that on any given day the demand would be greater than 105
   a. 0.27
   b. 0.33
   c. 0.158
   d. 0.15

c => don't do mistake in reading variance to standard deviation.

$P(X > 105)$
$P\left(Z > \frac{5}{5}\right)$
$P(Z > 1)$

32. An order winner is a set of screening criteria that permits a firm's products to be considered as possible candidates for purchase.
   a. False
   b. True

a => the definition written is of order qualifier.

33. The sum of weights in exponential smoothing is
   a. Equal to 1/e
   b. Equal to 1
   c. Greater then e
   d. EQUAL to e

b

34. Given the demand and forecast values below, the naïve forecast for September is:
Period Demand Forecast April 100 97 May 105 103 June 97 98 July 102 105 August 99 102 September
   a. 100.6
   b. 99
   c. Can not be determined

b

April
May
June
July
August

d. 102.0

35. The conditions when the economic order quantity model results in periodic ordering are: a) Fixed lead time b) Variable lead time c) Fixed Demand rate d) Variable demand rate

b => EOQ model is actually itself a periodic inventory control method.

a. b and d
b. a and c
c. c and d
d. a and b

36. Which of the following represents the primary objective of aggregate production planning?

a

a. Minimizing total production costs
b. Maximizing customer satisfaction
c. Maximizing production efficiency
d. Minimizing workforce turnover

37. The smoothing constant, alpha, in the exponential smoothing forecast

a

a. must be a value between 0.0 and 1.0.
b. must always be a value less than 0.10.
c. should be equal to the time frame for the forecast
d. must always be a value greater than 1.0

38. Which of the following statement is incorrect:

c

a. Scheduling aims to maximize the utilization.
b. Efficiency is the ratio of output and input.
c. Efficiency and utilization are the same thing
d. Load leveling is done to even out the utilization.

Section 2: Inventory

Annual demand for a product is 40,000 units. The product is used at a constant rate over the 365 days the company is open every year. The annual holding cost for the product is estimated to be $2.50 per unit and the cost of placing each order is $125.00.

1. If the company orders according to the economic order quantity (EOQ) formula then its optimal order size for this product is

a

a. 2,000 units.
b. 4,000 units.
c. 20,000 units.
d. 40,000 units.

2. If the company orders according to the economic order quantity (EOQ) formula then _____ orders are placed annually.

D/Q = 20

a. 5
b. 10
c. 15
d. 20

3. If the company orders according to the economic order quantity (EOQ) formula, then the time between orders (order cycle time) is

365 / #orders

a. 18.25 days.
b. 24.33 days.
c. 36.5 days.
d. 73 days.

4. If the company orders according to the economic order quantity (EOQ) formula then its total annual inventory cost for this product is

total inventory = carrying_cost * Q = 2.5 * 2000 = 5000$

a. $100,000.
b. $50,000.
c. $5,000.

d. $2,500.

5. If the company orders according to the economic order quantity (EOQ) formula, then its average inventory level for this product is
a. 20,000 units.
b. 10,000 units.
c. 2,500 units.
d. 1,000 units.

d => Q/2

Section 3: Forecasting
A forecasting model has produced the following forecasts:

Period	Demand	Forecast	Error
January	120	110	10
February	110	115	-5
March	115	120	-5
April	125	115	10
May	130	125	5

1. The mean absolute deviation (MAD) for the end of May is
(a) 7.0. (b) 7.5. (c) 10.0. (d) 3.0 a

2. The mean absolute percent deviation (MAPD) for the end of May is
(a) 0.0250. (b) 0.0583. (c) 0.5830. (d) 0.6670. b

3. At the end of May, the average error would be
(a) 7. (b) 5. (c) 3. (d) 1. c

4. At the end of May, the tracking signal would be
(a) 0.000. (b) 0.667. (c) 1.333. (d) 2.143. d

$\frac{\text{RSFE}}{\text{MAD}}$ Ft

Section 4: Forecasting II
A local building products store has accumulated sales data for 2*4 lumber and the number of building permits in its area for the past 10 quarters

Quarter	Permits	Lumber sales
1	8	11
2	10	16.3
3	7	8
4	8	10
5	15	15
6	6	7.6
7	5	6.2
8	8	11
9	9	15.
10	12	16

4 + 3 + 2 + 3 + 5
+0.4
+1.4
+.4
+1.3

1. Using time series regression the forecast for quarter 11 is: c
a) 14 b) 16 c) 13 d) 10

2. On an average, if the number of permits increase by 1, by how much the lumber sales increase:
a) 1.95 b) 2.25 c) 1.05 d) .75

3. Regressing lumber sales on number of building permits, the sales forecast for 11 building permits is:
a) 13 b) 15 c) 14 d) 17

4. For which of the following pairs is the correlation coefficient value higher
   a) Quarter and lumber sales b) Permits and Lumber Sales

Section 5: Aggregate Production Planning

The Wetski Water Ski Company is the world's largest producer of water skis. As you might suspect, water skis exhibit a highly seasonal demand pattern, with peaks during the summer months and valleys during the winter months. Given the following costs and quarterly sales forecasts, use the transportation method to design a production plan that will economically meet demand. As per typical practice the inventory costs are to be accounted in the period of usage. It's stacked in the increasing cost order and drawn in the reverse order, i.e. cheapest first.

Inventory carrying cost:	$3.00 per pair of skis per quarter
Production per employee:	1000 pairs of skis per quarter
Regular workforce:	50 workers
Regular capacity:	50,000 pairs of skis
Overtime capacity:	50,000 pairs of skis
Subcontracting capacity:	40,000 pairs of skis
Cost of regular production:	$50 per pair of skis
Cost of overtime production:	$75 per pair of skis
Cost of subcontracting:	$85 per pair of skis

k= thousands

1. What is the cost of the plan of period 1?
   a) 2500k b) 3500k c) 4500k d) 5500k

2. What is the cost of the plan of period 2?
   a) 10130k b) 10140k c) 10150k d) 10160k

3. What is the cost of the plan of period 3?
   a) 14890k b) 14990k c) 14980k d) 19490k

4. What is the cost of the plan of period 4?
   a) 2620k b) 2630k c) 2640k d) 2650k

5. What is the Total cost of the plan?
   a) 30290k b) 31290k c) 32290k d) 33390k