



## CII Institute of Logistics

Post Graduate Diploma in Supply Chain Management  
Semester-end Examination June 2008

### DEMAND PLANNING & FORECASTING

Time : Three Hours

Marks : 100

#### Part A

Answer all questions (10 x 1 = 10 Marks)

#### Indicate True or False:

- 1) Secular trends represent the long-term direction of a time series.  
**True / False**
- 2) Time-series analysis helps us to analyze part trends, but it cannot aid us in future uncertainties.  
**True / False**
- 3) When we are predicting far into the future, a second-degree equation usually gives more accurate predictions than a liner equation.  
**True / False**
- 4) The repetitive movement around a trend line in a 2-year period is best described as a seasonal variation.  
**True / False**
- 5) Removing the highest and lowest actual-to-moving average values from each period when compounding seasonal indices reduces the extreme cyclical and irregular variations.  
**True / False**

#### Choose the correct answer

- 6) Suppose that a particular time series should be fitted with a parabolic curve. The general form for this second – degree equation is  $Y = a + b + c^2$ . What do the 'x' s represent in this formula?
  - a) Coded values of the time variables
  - b) A numerical constant that is determined by a formula
  - c) Estimates of the dependent variable
  - d) None of these above

- 7) Assume that a time series with annual data for the years 1999 – 2007 is described well by a second – degree equation,  $Y = 5 + 3x + 9x^2$ . Based only on this secular trend, what is the forecast value for 2008?
  - a) 161
  - b) 245
  - c) 347
  - d) 293.75
  - e) 200.75
- 8) Assume that you have been given quarterly sales data for a 5 year period. To use the ratio-to-moving average method of computing a seasonal index, your first step would be:
  - a) Compute the 4 quarter moving average
  - b) Discard highest and lowest values for each quarter
  - c) Calculate the 4 quarter moving total
  - d) None of these above
- 9) If a time series has an even number of years and we use coding, then each coded interval is equal to:
  - a) 1 year
  - b) 2 years
  - c) 1 month
  - d) 6 months
  - e) None of these
- 10) Which of the following are common reasons for studying both secular trends and seasonal variations:
  - a) To allow elimination of the component from the series
  - b) To describe part patterns
  - c) To project part patterns into the future
  - d) All the above
  - e) None of the above

**Part B**

Answer any three (3 x 15 = 45)

- 1) a) What is the need for forecasting in a logistics system?  
b) Describe the steps involved in demand and forecasting by taking a suitable consumer durable product.
- 2) Explain the different approaches to demand forecasting stating the reasons for resorting to these approaches.
- 3) a) How will you use the Delphi method for Logistics research?  
b) Explain the need for demand data aggregation.
- 4) Write short notes on the following.
  - a) Treatment of 'spikes' in demand data
  - b) Selection of forecasting method with reference to purpose and time span.

**Part C**

Answer all questions (4 5 marks)

**(15 Marks)**

1. An aluminium extrudes forecasted the demand for a shower stall extrusion to be 500 per month each of the three months. The actual demands turned out to be 400, 560 and 700. Calculate his forecast errors:-
  - a) MAD
  - b) Bias

**(20 Marks)**

2. A paper box company makes carryout pizza boxes. The operations planning department knows that the pizza sales of a major client are a function of the advertising rupees the client spends an account of which they can receive in advance of the expenditure. Operation planning is interested in determining this relationship between the clients' advertising and sales. The amount of pizza boxes the client will order, in rupee volume. Find out the estimated regression line between future sales and advertising given in the following historical data:

Quarter	Advertising (Rs.100,000)	Sales (Rs. 1,000,000)
1	4	1
2	10	4
3	15	5
4	12	4
5	8	3
6	16	4
7	5	2
8	7	1
9	9	4
10	10	2

**(10 Marks)**

3. Milo has first order exponential smoothing model that has forecasted 103,500 bushels for #3 grade wheat. Last years' May production of #3 grade wheat was 70,500 bushels. Given that  $\alpha = 0.20$  appears to be a good smoothing co-efficient for Milo. Calculate double exponential smoothed forecast for June.

\*\*\*\*\*