

國立台灣科技大學九十七學年度碩士班招生試題

系所組別：工業管理系碩士班乙組

科目：生產管理

總分 100 分

- (10%) Suppose that the original demand history of a certain commodity for the past eight months is given by 20, 40, 52, 34, 24, 46, 60, 44. Estimate the seasonal factors and deseasonalized demand using centered moving averages. (Show all steps and calculations for full credit. Round to 2 decimal places in all calculations.)
- (15%) Trigg and Leach suggested the following adaptive response-rate exponential smoothing method. Along with smoothing the original series, also smooth the error e_t and the absolute error $|e_t|$ for period t . The smoothed values of the error and absolute error are given by

$$E_t = \beta e_t + (1 - \beta)E_{t-1},$$

$$M_t = \beta |e_t| + (1 - \beta)M_{t-1}.$$

where β is a smoothing constant. The forecast made in period t for period $t + 1$ is obtained by the usual exponential smoothing equation, using $\alpha_t = \frac{|E_t|}{M_t}$ as the smoothing constant. That is,

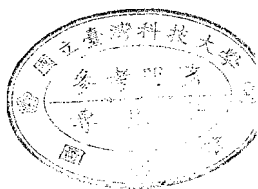
$$F_{t+1} = \alpha_t D_t + (1 - \alpha_t)F_t$$

where D_t and F_t are the actual observation and forecast for period t .

- (5%) What is the idea behind this approach?
- (10%) Given the following demand data:

| Period | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--------|----|----|----|----|----|----|----|----|----|----|----|----|
| Demand | 15 | 35 | 90 | 65 | 25 | 50 | 80 | 95 | 35 | 60 | 85 | 75 |

Suppose that the demand forecast for the first period is 17. Apply the Trigg-Leach method with $\beta = 0.1$ to obtain one-step-ahead forecasts assuming that $E_1 = e_1$ (the observed error in period 1) and $M_1 = |e_1|$. Compare the mean absolute deviation (MAD) for the one-step-ahead forecasts obtained by the method and by simple exponential smoothing with smoothing constant α fixed at 0.2. Consider the forecasts for period 9 to 12 only. (Round all forecasts to integer, and all other calculations to one decimal place. Show all your works for full credit.)



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3. (15%) Give brief descriptions of Aggregate Production Planning (APP) and Master Production Scheduling (MPS)? Discuss the relationship and differences between APP and MPS.
4. (10%) The "planar location models" commonly used to determine facility locations make the following assumptions:
 - i. A plane is an adequate approximation of a sphere.
 - ii. Any point on the plane is a valid location for a facility.
 - iii. Facilities may be idealized as points.
 - iv. Distances between facilities are adequately represented by planar distance.
 - v. Travel costs are proportional to distance.
 - vi. Fixed costs are ignored.
 - vii. Issues of distribution can be ignored.

Discuss the applicability and shortcomings of these assumptions.
5. (10%) Just-In-Time 對於供應商的夥伴關係有那些特徵?
6. (10%) 試說明 Forward scheduling 及 Backward scheduling 兩排程法之差異，並比較其適用之情境。
7. (10%) 比較 Postponement 及 Channel assembly 之差異。
8. (10%) 何謂 Theory of Constraints? 對於作業管理有何應用範疇?
9. (10%) 解釋下列存貨政策相關名詞：
 - (1) Service Level
 - (2) Reorder Point

