國立成功大學

111學年度碩士班招生考試試題

編　號：238

系　所：工業與資訊管理學系

科　目：生產與作業管理

日　期：0220

節　次：第 2 節

備　註：可使用計算機

※ 考生請注意：本試題可使用計算機。　請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. (15%) The multi-attribute decision-making (MADM) method can be a useful approach for solving problems of production and operation management (POM). Provide a POM example and describe how to formulate and solve your example by using MADM method.

2. (10%) Decision trees (DTs) are usually applied to resolve POM problems. Describe the situations suitable for applying DTs. Provide a POM example that is formulated and solved by DTs.

3. (10%) The waiting-line problem is a critical issue of a service system. Provide and describe the factors that the management can improve the service system.

4. (15%) To carry out the lean system philosophy in a supply chain, describe the critical factors that should be concerned by a firm and its suppliers.

5. (30 points) Cheng Kung Baking Company (CKBC) markets doughnuts through a chain of food stores. It has been experiencing overproduction and underproduction because of forecasting errors. The following data are its demand in dozens of doughnuts for the past four weeks. Doughnuts are made for the following day; for example, Sunday's doughnut production is for Monday's sales, Monday's production is for Tuesday's sales, and so forth. The bakery is closed Saturday, so Friday's production must satisfy demand for both Saturday and Sunday.

	4 Weeks Ago	3 Weeks Ago	2 Weeks Ago	Last Week
Monday	2,200	2,400	2,300	2,400
Tuesday	2,000	2,100	2,200	2,200
Wednesday	2,300	2,400	2,300	2,500
Thursday	1,800	1,900	1,800	2,000
Friday	1,900	1,800	2,100	2,000
Saturday	(closed on Saturday)			
Sunday	2,800	2,700	3,000	2,900

Make a forecast for this week based on the following:

a) (10 points) Daily, using a simple four-week moving average.

b) (10 points) Daily, using a weighted moving average with weights of 0.40, 0.30, 0.20, and 0.10 (most recent to oldest week).

c) (5 points) CKBC is also planning its purchases of ingredients for bread production. If bread demand had been forecast for last week at 22,000 loaves and only 21,000 loaves were actually demanded, what would CKBC's forecast be for this week using exponential smoothing with $\alpha = 0.10$?

d) (5 points) Suppose, with the forecast made in (c), this week's demand actually turns out to be 22,500. What would the new forecast be for the next week?

6. (20 points) Cheng Kung Industries Inc. (CKI) is a Tier 1 supplier to various industries that use components made from sheet metal in their final products. Manufacturers of desktop computers and electronic devices are its primary customers. CKI orders a relatively small number of different raw sheet metal products in very large quantities. The purchasing department is trying to establish an ordering policy that will minimize total costs while meeting the needs of the firm. One of the highest volume items it purchases comes in precut sheets direct from the steel processor. Forecasts based on historical data indicate that CKI will need to purchase 200,000 sheets of this product on an annual basis. The steel producer has a minimum order quantity of 1,000 sheets, and offers a sliding price scale based on the quantity in each order, as follows.

Order Quantity	Unit Price
1,000-9,999	$2.35
10,000-29,999	$2.20
30,000+	$2.15

The purchasing department estimates that it costs $300 to process each order, and CKI has an inventory carrying cost equal to 15 percent of the value of inventory. Based on this information, use the price-break model to determine an optimal order quantity.