Graduateship in Marketing - Stage 4

LOGISTICS MANAGEMENT

FRIDAY, AUGUST 23, 2002. TIME: 9.30 am - 12.30 pm

Please answer the question in Section A, and **ONE** question from each of Sections B, C and D.
(If more than the specified number of questions in Sections B, C and D are attempted, delete those questions you do not wish to have marked. Otherwise the examiner will mark the **FIRST** question in Sections B, C and D.)

Section A carries **40%** of the marks. All other questions carry equal marks.
Do NOT repeat questions in the answers, but show clearly the number of the question attempted on the appropriate page of the Answer Book.

(Note: Marks are awarded for the relevant use of contemporary Irish and international examples of marketing practice)

SECTION A (40%)

1. **Case: Rio Bravo Electricos**

   (a) Review the arguments for and against the proposal to centralise the lead preparation area at the Rio Bravo plant.

   (b) Analyse the cost argument.

   (c) Discuss the non-cost issues that affect the proposal.

   (d) Explain the implications of Vazguez's quantitative analysis.

   (e) Evaluate the proposal.

SECTION B (20%)

2. Describe the changing nature of the market-place and its consequences for logistics.

3. *"Managing the processes that deliver customer value is the key to market-place success."* Martin Christopher.
   Discuss these processes and how to manage them to deliver customer value.

P.T.O.

SECTION C (20%)

4. A company uses 6,000 Widgets and 9,000 Gadgets each year of 48 working weeks. The company gets the Widgets from a regular supplier at a cost of €48 per unit. It gets the Gadgets from a different regular supplier at a cost of €60 per unit. Because of the technical characteristics of the product, the cost of ordering, receiving and testing each batch of either Widgets or Gadgets has been estimated at €200.

   A third supplier has offered to supply both Widgets and Gadgets on a regular monthly basis, i.e. twelve times a year. He intends to quote the same price for both types, whether Widgets or Gadgets. The company has estimated the cost of ordering, receiving and testing of each monthly batch to be €300.

   Whichever supplier is used, the storage costs are €6 per unit per annum based on the average annual stock. Assume certainty of demand, lead-time and costs.

   (a) What should the economic order quantities be for Widgets and Gadgets from the present suppliers?

   (b) What is the total minimum inventory cost for Widgets and Gadgets from the present suppliers?

   (c) What should the price be for a Widget and for a Gadget from the new supplier to make a change worthwhile?

5. A company wishes to decide on a production and delivery schedule for a product for the next five months. From past records the manager knows that 4,000 units can be produced and delivered per month. Also, an additional 1,200 units can be produced and delivered monthly on an overtime basis. The unit cost of items produced and delivered on a regular time basis is €60 and €80 on an overtime basis. Contracted sales are as follows:

Month	**Contracted Sales**
June	2,400
July	4,200
August	4,800
September	6,000
October	8,000

   Inventory carrying costs are €12 per unit per month.
   The company does not want any inventory carried over beyond October.

The company wants to know the monthly production and delivery schedule that minimizes total costs.
Formulate a linear programme for this problem.
Do not solve it.

SECTION D (20%)

6. Pretty Paint Producers (PPP) plc produces two types of varnish: high gloss and matt, with the following selling prices and unit variable costs as given below.

Product	**Selling Price (€) per litre**	**Unit variable cost (€) per litre**
Matt	16.0	11.0
High Gloss	19.0	13.0

Each litre of matt varnish requires six minutes of skilled labour and each litre of high gloss requires twelve minutes of skilled labour. In a given day there are 500 man hours of skilled labour available. Also, there are 125 ounces of an important blending chemical available each day. Each litre of matt varnish needs 0.05 ounces of the blending chemical and each gallon of high gloss varnish needs 0.02 ounces of the chemical. The processing capacity at the plant is limited to 4,000 litres of varnish per day.

The company is committed to supplying a leading retailer with 6,000 litres of matt varnish and 3,000 litres of high gloss varnish each working week (consisting of five days). In addition, there is an agreement with the unions that at least 2,500 litres are produced each day. PPP management would like to determine the daily production volume that will maximize total contribution.

(a) Develop a linear programming model of the production problem facing Pretty Paint Producers.

(b) Use a graphical approach to determine the optimum daily production plan and the consequent contribution.

(c) The union is pressing for an overtime wage rate of €22 per hour above the wage rate for skilled labour. Determine the consequences of this claim on PPP's profitability. Comment on your answer.

(d) In the original problem (where overtime was not considered) determine the maximum range of variation in the unit contribution figure on a litre of high gloss varnish for the original solution to remain optimal.

P.T.O.

7. A wholesale company has nine storage depots which it proposes to rationalise. Four depots Q, R, S and T are to be expanded and five depots: A, B, C, D and E are to be closed. Thirty six of the mechanical loaders in the depots to be closed will be required for use in the enlarged depots.

The number of mechanical loaders available in the five depots to be closed are:
A: 5, **B: 7,** **C: 11,** **D: 8** and **E: 9.**

The number of additional mechanical loaders required at the four depots to be expanded are:
Q: 8, **R: 9,** **S: 11,** and **T: 8.**

The cost of transporting one mechanical loader, in thousands of Euro, between the depots is given below:

Depots to be closed	**Depots to be expanded**			
	Q	**R**	**S**	**T**
A	3	3	7	9
B	6	5	3	3
C	6	4	8	7
D	5	4	5	4
E	4	3	6	5

(a) Use a transportation algorithm to find a minimum cost plan for meeting the rationalization requirement by transfers between depots.

(b) State at which depots there will be surplus loaders.

(c) State with reasons whether or not your solution is unique.