



Graduateship in Marketing - Stage 4

LOGISTICS MANAGEMENT

FRIDAY, 5TH MAY 2000. 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.

SECTION A (40%)

1. **Case: Applichem**

- (a) Review the differences in productivity amongst the Applichem plants.
- (b) Use the information in the case to estimate the differences in the cost of producing Release-ease at the Gary and Frankfurt plants.
- (c) Evaluate the arguments in favour of keeping production at Gary and of shifting it from Gary to Frankfurt.
- (d) Recommend which you prefer and give reasons why.
- (e) Include a supporting report showing your projected cost justifications.

SECTION B (20%)

2. *“The challenge to the global business will increasingly be seen as logistical.”*

Martin Christopher

How does Christopher justify this statement?

3. Discuss the concept of ‘time-based competition’.

P.T.O.

SECTION C (20%)

4. Demand for tins of dilutable orange in a supermarket is usually about 200 trays a month. Ordering costs are £50 per order and the basic unit price is £10 per tray. Carrying costs are 30% per month.

(a) Determine the optimum number of trays of tins of orange that the supermarket should order at a time and the number of orders per month.

(b) Discounts are available as follows:

120 to 159	less 1.0%
160 to 199	less 2.0%
200 and over	less 4.0%

What is the most economical quantity to order?

(c) Discuss whether it would be advisable to apply the same policy to less and more expensive products that are supplied on the same discount conditions.

5. A video rental shop has collected data from 25 hours randomly selected over the past month on the demand for videos per hour. The data are shown summarised below:

Rental Demand	70	80	90	100	110	
Number of hours	2	5	8	7	3	Total = 25

The current staff policy is to employ only one assistant to deal with customers. Part of the collection of data involved the researcher posing as a customer and observing the behaviour of customers. It was clear that the assistant could not handle any more than 90 customers an hour. Management are concerned about the effect on lost customers of a queue build-up over an evening, which usually lasts five hours.

(a) Use the following five random numbers to simulate five hours of demand for the video rental shop:

15 48 71 56 90

How many rentals does the simulation indicate will be lost due to a shortage of staff?

- (b) What does the simulation indicate would be the average number of videos rented for the five hour evening? How does this compare with an expected demand as calculated using a probability distribution based on the above data?
- (c) Discuss the procedure you have used, its weaknesses if any and how to resolve them.

SECTION D (20%)

6. Forty Shades Ltd. produces two lawn fertilizers GreenGrow and EverGreen each of which is a blend of two raw materials N4 and K5. During the current production period 900 kilos of N4 and 400 kilos of K5 are available. Each kilo of GreenGrow uses $\frac{3}{5}$ of a kilo of N4 and $\frac{2}{5}$ of a kilo of K5. Each kilo of EverGreen uses $\frac{3}{4}$ of a kilo of N4 and $\frac{1}{4}$ of a kilo of K5. In addition, a current limit on the availability of packaging materials restricts the production of EverGreen to a maximum of 500 kilos.
- (a) If the profit contribution for both products is £3 per kilo, how many kilos of each product should Forty Shades manufacture?
 - (b) Should it be a concern to Forty Shades that the availability of packaging materials is restricting the production of EverGreen?

What should happen to the production quantities and the projected profit if the firm were able to remove the restriction in the amount of EverGreen that could be produced?

- (c) If the restriction were removed there is the possibility that an advertising programme could help to increase the profit contribution for EverGreen to £4. How might this affect the optimal production quantities? Comment on the advisability of such an advertising programme.

P.T.O.

7. A Sales Manager is in charge of planning and coordinating the annual training programme for his company. The following table shows the tasks involved, the immediately preceding tasks, and for each task the most likely estimate, the optimistic estimate and the pessimistic estimate.

		Duration in Days			
Task	Preceding tasks	Most likely (m)	Optimistic (a)	Pessimistic (b)	
A Plan topic	-	2	1.5	2.5	
B Obtain speakers	A	2.5	2	6	
C List meeting locations	-	2	1	3	
D Select location	C	2	1.5	2.5	
E Finalise speaker travel plans	B,D	1	0.5	1.5	
F Make final check with speakers	E	2	1	3	
G Prepare and mail brochures	B,D	3.5	3	7	
H Take reservations	G	4	3	5	
I Handle last-minute details	F,H	2	1.5	2.5	

Using the Project Evaluation Review Technique (PERT) the mean time, μ , and the standard deviation, σ , for the duration of each task are estimated from the most likely (m), optimistic (a) and pessimistic (b) estimates by using the formulae:

$$\mu = (4m + a + b) / 6 \qquad \sigma = (b - a) / 6$$

- For each task find the mean and standard deviation.
- Draw a network for this survey and use the mean times to find the critical path.
- Determine the mean and standard deviation of the critical path duration.
- If the sales manager wants a 0.99 probability of completing the project on time, how far ahead of the scheduled meeting date should he begin working on the project?
State any assumptions that you make.
(This question requires statistical table for the Normal Distribution)