



EXAMINER'S REPORT

AUGUST 2004

LOGISTICS MANAGEMENT

General Comments

This year's August results were the worst ever, with most getting "F". There were a few "Cs". Unlike recent years, when the case and the theory were done well while the quantitative questions were not done as well, in this exam none were really done well. The theory and case are simply a matter of study, practice and hard work. I will focus on the more quantitative aspects in this report. The quantitative sections contain relatively predictable applications. Section C always has a question on Inventory and, in this paper, Section D had a standard question on transportation. Most people did these. So I will focus on the inventory question.

The way this course and exam is structured requires one to first explore the theory, then the techniques and finally how to apply the ideas in practice. This follows a learning cycle. Ideally people should look at the cases early on to get an idea of the types of problems that occur. These are mixtures of marketing, logistics, mathematics and strategy. Subsequently one should get into the theory, but not spend the year learning it off. Students generally have a clear understanding of what is in the text and some practical illustrations from outside, including from Irish applications. The middle part of the year should be spent on the quantitative techniques, hopefully linking them into the cases and the theory, and anecdotes about Irish companies where possible. People who failed invariably did two or three sections poorly and were not able to compensate from another section. It is safer to prepare all the sections.

The case questions are designed to bring one through a process of analysis, evaluation, diagnosis and prognosis. Most people seemed to have not prepared the case section well. It should be understood that Logistics is important not just of itself but also because it requires one to put on one's quantitative thinking cap when addressing marketing problems.

Quantitative questions

Firstly, before I get into specifics, I would like to emphasise that there is no need to do rough work and then write your answer out neatly. It wastes your precious time. Do the question as best you can. If you think you are making a mistake say so, and try to correct the mistake. If you blank out, just leave two pages so that you can move onto other questions. Maybe later you will be able to do the rest of that question. Do not waste your time doing restarts.

The idea of having two different quantitative sections is to separate the less standard from the standard, the unstructured from the straightforward application of algorithms.

Section C contained question on **stock (inventory) control**. This is a long section in the text and likely to occur every year. Many got the economic order quantity of 36.5 units, but a surprising number got it wrong. The biggest problem was deciding are you working on the basis of a day, a week, 365 days, or whatever. Once you decide stick to it. The biggest problem is where you have some figures per day and others per year.

Generally the key to my seeing if inventory is understood is to put in something unusual and to require a calculation of total costs. Keeping one's head is critical. People are used to annual inventory costs. The figures given were daily costs. Some people converted the figures into an annual basis. Both methods are correct. The most common error was to mix up the two approaches.

Total costs	=	$\frac{1}{2} Q C_h + D/Q$	+ demand D by purchase cost
For the EOQ case	=	$\frac{1}{2}$ by 36.5 by €0.12	+ 4/36.5 by €20 + 4 by €10 (daily)
	=	€2.19	+ €2.19 + €40 = €44.38 (daily)
Multiplied by 365	=	€799	+ €799 + €4,600 = €6,199 (annually)
For the 150 case	=	$\frac{1}{2}$ by 150 by €0.12	+ 4/150 by €20 + 4 by €10 (daily)
	=	€9	+ €0.55 + €36 = €45.55 (daily)
Multiplied by 365	=	€3,285	+ €201 + €3,140 = €6,626 (annually)

So, it was better to not make orders of 150 cases.

At what point of discount does it become worthwhile?

The new stock cost minus the old stock cost is €0.55 - €4.38 = €5.17

Spread over sales of 4 units this becomes €1.3 per unit.

The starting price is €10. So we need at least €1.3 saving per €10, i.e. 13% or more.

Section C also contained a **formulation** question.

The key to this is the starting point. You must take an immensely practical point of view and say "what do we need to know here?". How much chicken, beef, pork and cereal additive do I need for each type of product: Non-Label, Kitty and Top-Cat?"

I should define my variables as X_{CN} = the number Kg of chicken used in Non-Label, etc.

The main formulation is about proportions, which most people missed.

Section D: Standard Quantitative questions

The idea of having two different quantitative sections is to separate the less standard from the standard, the unstructured from the straightforward application of algorithms.

The **transport** question is an example of a standard application of an algorithm which few people did well. Many even ignored the need for a dummy depot.

The other question in Section D was a standard application of **graphical linear programming** including minimum (greater than) constraints.

This kind of problem is impossible to do without adequate preparation.