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:  Blanchard Importing and Distribution Co., Inc.**

   (a)   Describe and evaluate the main features of Blanchard's original scheduling system, emphasizing possible weaknesses in the system.

   (b)   Do the same for the actual scheduling system run by Bob Young and Eliot Wallace.

   (c)   What features do you think would offer the best possibilities of producing significant cost savings?   How do you think these savings could be achieved?

   (d)   Calculate and show the savings that could be made using your improved system.

## SECTION B (20%)

2.   *"Organizations need to re-define service in terms which have relevance to customers."*  Martin Christopher.
   Describe how this can be done.

3.   Discuss the move to supply chain management.

**P.T.O.**

4.  Cartons of letterhead stationery sell for €10 a unit, but a 10% discount is offered for lots of 150 cartons or more. A company uses 4 cartons a day. It costs the company €20 to place an order, and the holding costs are 12 cent per day.

    (a)   Should the company take advantage of the discount?

    (b)   Determine the range of % discount that when offered for lots of 150 cartons or more will not result in financial advantage for the company.

5.  A pet-food manufacturer produces tinned cat-food from four ingredients: chicken, beef, pork and a cereal additive. The company produces three products: Non-label (for sale through supermarkets), Kitty and Top-Cat. The company has the following amounts of each ingredient available on a regular basis and at the following cost:

    |                 | Kg/Day    | Cost/Day (Cent) |
    |-----------------|-----------|-----------------|
    | **Chicken**     | 400       | 40              |
    | **Beef**        | 600       | 60              |
    | **Pork**        | 300       | 50              |
    | **Cereal Additive** | Unlimited | 10          |

    The specification for each type of cat-food is as follows.

    |            | Specifications                                              | Selling Price/Kg (Euro) |
    |------------|-------------------------------------------------------------|-------------------------|
    | **Non-Label** | Not more than 10% beef and pork combined. Not less than 30% chicken. | 1.80          |
    | **Kitty**     | Not more than 30% cereal additive At least 20% beef.     | 2.50                    |
    | **Top-Cat**   | No cereal additive. Not more than 40% chicken and pork combined. | 3.50              |

    The pet-food manufacturer wants to know how many of the three products to manufacture so as to maximize total profits assuming that all produced are sold. Formulate a linear programme for this problem. Do not solve it.

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 (Euro) per litre | Unit variable cost (Euro) 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 grammes of an important blending chemical available each day. Each litre of matt varnish needs 0.05 grammes of the blending chemical and each litre of high gloss varnish needs 0.02 grammes 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.

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.

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