Pricing decisions and profitability analysis

A company supplying capital equipment to the engineering industry is part of a large group of diverse companies. It determines its tender prices by adding a standard profit margin as a percentage of its prime cost.

Although it is working at full capacity the group managing director considers the company’s annual return on capital employed as inadequate.

You are required, as the group assistant management accountant, to provide him with the following information:

(a) why the return-on-prime-cost (ROPC) approach to tendering would be likely to yield an inadequate return on capital employed; (7 marks)
(b) the steps involved in calculating a return on capital employed (ROCE) tendering rate for a particular contract; (7 marks)
(c) three problems likely to be encountered in meeting a pre-set profit target on a ROCE basis. (6 marks)

CIMA P3 Management Accounting

It has been stated that companies do not have profitable products, only profitable customers. Many companies have placed emphasis on the concept of Customer Account Profitability (CAP) analysis in order to increase their earnings and returns to shareholders. Much of the theory of CAP draws from the view that the main strategic thrust operated by many companies is to encourage the development and sale of new products to existing customers.

Requirements:
(a) Briefly explain the concept of CAP analysis. (5 marks)
(b) Critically appraise the value of CAP analysis as a means of increasing earnings per share and returns to shareholders. (15 marks)

CIMA Stage 4 Strategic Management Accounting and Marketing

A producer of high quality executive motor cars has developed a new model which it knows to be very advanced both technically and in style by comparison with the competition in its market segment.

The company’s reputation for high quality is well-established and its servicing network in its major markets is excellent. However, its record in timely delivery has not been so good in previous years, though this has been improving considerably.

In the past few years it has introduced annual variations/improvements in its major models. When it launched a major new vehicle some six years ago the recommended retail price was so low in relation to the excellent specification of the car that a tremendous demand built up quickly and a two-year queue for the car developed within six months. Within three months a second-hand model had been sold at an auction for nearly 50% more than the list price and even after a year of production a sizeable premium above list price was being obtained.

The company considers that, in relation to the competition, the proposed new model will be as attractive as was its predecessor six years ago. Control of costs is very good so that accurate cost data for the new model are to hand. For the previous
model, the company assessed the long-term targeted annual production level and calculated its prices on that basis. In the first year, production was 30% of that total.

For the present model the company expects that the relationship between first-year production and longer-term annual production will also be about 30%, though the absolute levels in both cases are expected to be higher than previously.

The senior management committee, of which you are a member, has been asked to recommend the pricing approach that the company should adopt for the new model.

You are required
(a) to list the major pricing approaches available in this situation and discuss in some detail the relative merits and disadvantages to the company of each approach in the context of the new model; (15 marks)
(b) to recommend which approach you would propose, giving your reasons; (5 marks)
(c) to outline briefly in which ways, if any, your answers to (a) and (b) above would differ if, instead of a high quality executive car, you were pricing a new family model of car with some unusual features that the company might introduce. (5 marks)

In an attempt to win over key customers in the motor industry and to increase its market share, BIL Motor Components plc has decided to charge a price lower than its normal price for component TD463 when selling to the key customers who are being targeted. Details of component TD463’s standard costs are as follows:

<table>
<thead>
<tr>
<th>Component TD463</th>
<th>Machine Group 1 (£)</th>
<th>Machine Group 7 (£)</th>
<th>Machine Group 29 (£)</th>
<th>Assembly (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials (per unit)</td>
<td>26.00</td>
<td>17.00</td>
<td>—</td>
<td>3.00</td>
</tr>
<tr>
<td>Labour (per unit)</td>
<td>2.00</td>
<td>1.60</td>
<td>0.75</td>
<td>1.20</td>
</tr>
<tr>
<td>Variable overheads (per unit)</td>
<td>0.65</td>
<td>0.72</td>
<td>0.80</td>
<td>0.36</td>
</tr>
<tr>
<td>Fixed overheads (per unit)</td>
<td>3.00</td>
<td>2.50</td>
<td>1.50</td>
<td>0.84</td>
</tr>
<tr>
<td>Setting-up costs per batch of 200 units</td>
<td>31.65</td>
<td>21.82</td>
<td>3.05</td>
<td>5.40</td>
</tr>
</tbody>
</table>

Required:
(a) Compute the lowest selling price at which one batch of 200 units could be offered, and critically evaluate the adoption of such a pricing policy. (8 marks)
(b) The company is also considering the launch of a new product, component TDX489, and has provided you with the following information:

<table>
<thead>
<tr>
<th>Selling price (£)</th>
<th>13</th>
<th>12</th>
<th>11</th>
<th>10</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand (boxes)</td>
<td>5000</td>
<td>6000</td>
<td>7200</td>
<td>11200</td>
<td>13400</td>
</tr>
</tbody>
</table>

**Question IM 11.4**
Intermediate: Computation of minimum selling price and optimum price from price-demand relationships

**Intermediate: Computation of minimum selling price and optimum price from price-demand relationships**

**PRICING DECISIONS AND PROFITABILITY ANALYSIS**
The company only has enough production capacity to make 7000 boxes. However, it would be possible to purchase product TDX489 from a subcontractor at £7.75 per box for orders up to 5000 boxes and £7 per box if the orders exceed 5000 boxes.

Required:
Prepare and present a computation which illustrates which price should be selected in order to maximise profits. (8 marks)
(c) Where production capacity is the ‘limiting factor’, explain briefly the ways in which management can increase it without having to acquire more plant and machinery. (4 marks)
(Total 20 marks)

Josun plc manufactures cereal based foods, including various breakfast cereals under private brand labels. In March the company had been approached by Cohin plc, a large national supermarket chain, to tender for the manufacture and supply of a crunchy style breakfast cereal made from oats, nuts, raisins, etc. The tender required Josun to quote prices for a 1.5 kg packet at three different weekly volumes: 50,000, 60,000 and 70,000. Josun plc had, at present, excess capacity on some of its machines and could make a maximum of 80,000 packets of cereal a week.

Josun’s management accountant is asked to prepare a costing for the Cohin tender. The company prepares its tender prices on the basis of full cost plus 15% of cost as a profit margin. The full cost is made up of five elements: raw materials per packet of £0.30p; operating wages £0.12p per packet; manufacturing overheads costed at 200% of operating wages; administration and other corporate overheads at 100% of operating wages; and packaging and transport costing £0.10p per packet. The sales manager has suggested that as an incentive to Cohin, the profit margin be cut on the 60,000 and 70,000 tenders by ½% and 1% to 14½% and 14½% respectively. The manufacturing and administration overheads are forecast as fixed at £12,500 per week, unless output drops to 50,000 units or below per week, when a saving of £1000 per week can be made. If no contract is undertaken then all the manufacturing and administration overheads will be saved except for £600 per week. If the tender is accepted the volume produced and sold will be determined by the sales achieved by Cohin.

A week before the Cohin tender is to be presented for negotiation, Josun receives an enquiry from Stamford plc, a rival supermarket chain, to produce, weekly, 60,000 packets of a similar type of breakfast cereal of slightly superior quality at a price of £1.20 per 1.5 kg packet, the quality and mix of the cereal constituents being laid down by Stamford. This product will fill a gap in Stamford’s private label range of cereals. The estimated variable costs for this contract would be: raw materials £0.40p per packet, operating labour £0.15p per packet and packaging and transport £0.12p per packet. None of the 80,000 weekly capacity could be used for another product if either of these contracts were taken up.

You are required to:
(a) compute the three selling prices per packet for the Cohin tender using Josun’s normal pricing method; (3 marks)
(b) advise Josun, giving your financial reasons, on the relative merits of the two contracts; (6 marks)
(c) discuss the merits of full-cost pricing as a method of arriving at selling prices; (5 marks)
(d) make recommendations to Josun as to the method it might use to derive its selling prices in future; (3 marks)
(e) calculate the expected value of each tender given the following information and recommend which potential customer should receive the greater sales effort. It is estimated that there is a 70% chance of Stamford signing the contract for the weekly production of 60,000 packets, while there is a 20% chance of Cohin not accepting the tender. It is also estimated that the
probabilities of Cohin achieving weekly sales volumes of 50 000, 60 000 or 70 000 are 0.3, 0.5 and 0.2 respectively. The two sets of negotiations are completely independent of each other; (4 marks)

(f) provide, with reasons, for each of the two contracts under negotiation, a minimum and a recommended price that Josun could ask for the extra quantity that could be produced under each contract and which would ensure the full utilization of Josun’s weekly capacity of 80 000 packets. (4 marks)

(Total 25 marks)

Sniwe plc intend to launch a commemorative product for the 2004 Olympic games onto the UK market commencing 1 August 2002. The product will have variable costs of £16 per unit.

Production capacity available for the product is sufficient for 2000 units per annum. Sniwe plc has made a policy decision to produce to the maximum available capacity during the year to 31 July 2003.

Demand for the product during the year to 31 July 2003 is expected to be price dependent, as follows:

<table>
<thead>
<tr>
<th>Selling price per unit (£)</th>
<th>Annual sales (units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2000</td>
</tr>
<tr>
<td>30</td>
<td>1600</td>
</tr>
<tr>
<td>40</td>
<td>1200</td>
</tr>
<tr>
<td>50</td>
<td>1100</td>
</tr>
<tr>
<td>60</td>
<td>1000</td>
</tr>
<tr>
<td>70</td>
<td>700</td>
</tr>
<tr>
<td>80</td>
<td>400</td>
</tr>
</tbody>
</table>

It is anticipated that in the year to 31 July 2004 the availability of similar competitor products will lead to a market price of £40 per unit for the product during that year.

During the year to 31 July 2004, Sniwe plc intend to produce only at the activity level required to enable them to satisfy demand, with stocks being run down to zero if possible. This policy is intended as a precaution against a sudden collapse of the market for the product by 31 July 2004.

Required:

(Ignoring tax and the time value of money.)

(a) Determine the launch price at 1 August 2002 which will maximize the net benefit to Sniwe plc during the two year period to 31 July 2004 where the demand potential for the year to 31 July 2004 is estimated as (i) 3600 units and (ii) 1000 units. (12 marks)

(b) Identify which of the launch strategies detailed in (a)(i) and (a)(ii) above will result in unsold stock remaining at 31 July 2004.

Advise management of the minimum price at which such unsold stock should be able to be sold in order to alter the initial launch price strategy which will maximize the net benefit to Sniwe plc over the life of the product. (6 marks)

(c) Comment on any other factors which might influence the initial launch price strategy where the demand in the year to 31 July 2004 is estimated at 1000 units. (4 marks)

(Total 22 marks)
XYZ is the only manufacturer of a product called the X. The variable cost of producing an X is £1.50 at all levels of output.

During recent months the X has been sold at a unit price of around £6.25. Various small adjustments (up and down) have been made to this price in an attempt to find a profit maximising selling price.

XYZ's Commercial Manager (an economics graduate) has recently commissioned a study by a firm of marketing consultants ‘to investigate the demand structure for Xs and in particular to calculate the elasticity of demand for Xs produced by XYZ’. (Note: the elasticity of demand for a product is the proportion by which demand changes divided by the proportional price change which causes it.)

The consultants have reported back that at a unit price of £10 there is no demand for Xs but that demand increases by 40 Xs for each 1p (£0.01) that the unit price is reduced below £10. They have also reported that ‘when demand is at around half its theoretical maximum the elasticity of demand is approximately 1.’

Upon receiving this report the Commercial Manager makes the following statement:

Recent experiences gained in adjusting the unit selling price of the X suggest that the product has quite an elastic demand structure. Small changes in the unit selling price produce far larger proportionate increases in demand. I find it difficult to accept that the elasticity of demand for the X is 1.

You are required:
(a) to write a memorandum to the Commercial Manager reconciling the consultants' report with his own observations on the elasticity of demand for the X;
(10 marks)
(b) to calculate the profit maximising unit selling price for the X (accurate to the nearest penny) and to calculate the elasticity of demand for the X at that selling price;
(10 marks)
(Total 20 marks)

CIMA Stage 4 Management Accounting Decision Making

French Ltd is about to commence operations utilizing a simple production process to produce two products X and Y. It is the policy of French to operate the new factory at its maximum output in the first year of operations. Cost and production details estimated for the first year’s operations are:

<table>
<thead>
<tr>
<th>Product</th>
<th>Production resources per unit</th>
<th>Variable cost per unit</th>
<th>Fixed production overheads directly attributable to product</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Labour hours</td>
<td>Machine hours</td>
<td>Direct labour (£)</td>
</tr>
<tr>
<td>X</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Y</td>
<td>8</td>
<td>2</td>
<td>28</td>
</tr>
</tbody>
</table>

There are also general fixed production overheads concerned in the manufacture of both products but which cannot be directly attributed to either. This general fixed production overhead is estimated at £720 000 for the first year of operations. It is thought that the cost structure of the first year will also be operative in the second year.

Both products are new and French is one of the first firms to produce them. Hence in the first year of operations the sales price can be set by French. In the second and subsequent years it is felt that the market for X and Y will have become more settled and French will largely conform to the competitive market prices that will become established. The sales manager has researched the first year’s market
potential and has estimated sales volumes for various ranges of selling price. The
details are:

<table>
<thead>
<tr>
<th>Range of per unit sales prices (£)</th>
<th>Sales volume (£) (000)</th>
<th>Range of per unit sales prices (£)</th>
<th>Sales volume (£) (000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 24.00</td>
<td>36</td>
<td>Up to 96.00</td>
<td>11</td>
</tr>
<tr>
<td>24.01 to 30.00</td>
<td>32</td>
<td>96.01 to 108.00</td>
<td>10</td>
</tr>
<tr>
<td>30.01 to 36.00</td>
<td>18</td>
<td>108.01 to 120.00</td>
<td>9</td>
</tr>
<tr>
<td>36.01 to 42.00*</td>
<td>8</td>
<td>120.01 to 132.00</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>132.01 to 144.00</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>144.01 to 156.00*</td>
<td>5</td>
</tr>
</tbody>
</table>

*Maximum price.

The managing director of French wishes to ascertain the total production cost of X and Y as, he says, ‘Until we know the per unit cost of production we cannot properly determine the first year’s sales price. Price must always ensure that total cost is covered and there is an element of profit – therefore I feel that the price should be total cost plus 20%. The determination of cost is fairly simple as most costs are clearly attributable to either X or Y. The general factory overhead will probably be allocated to the products in accordance with some measure of usage of factory resources such as labour or machine hours. The choice between labour and machine hours is the only problem in determining the cost of each product – but the problem is minor and so, therefore, is the problem of pricing.’

Required:
(a) Produce statements showing the effect the cost allocation and pricing methods mentioned by the managing director will have on
   (i) unit costs,
   (ii) closing stock values, and
   (iii) disclosed profit for the first year of operation. (c. 8 marks)
(b) Briefly comment on the results in (a) above and advise the managing director on the validity of using the per unit cost figures produced for pricing decisions. (c. 4 marks)
(c) Provide appropriate statements to the management of French Ltd which will be of direct relevance in assisting the determination of the optimum prices of X and Y for the first year of operations. The statements should be designed to provide assistance in each of the following, separate, cases:
   (i) year II demand will be below productive capacity;
   (ii) year II demand will be substantially in excess of productive capacity.
   In both cases the competitive market sales prices per unit for year II are expected to be
   X – £30 per unit
   Y – £130 per unit
   Clearly specify, and explain, your advice to French for each of the cases described.
   (Ignore taxation and the time value of money.) (c. 8 marks)
   (Total 20 marks)
AB p.l.c. makes two products, Alpha and Beta. The company made a £500 000 profit last year and proposes an identical plan for the coming year. The relevant data for last year are summarized in Table 1.

Table 1: Actuals for last year

<table>
<thead>
<tr>
<th>Product</th>
<th>Alpha</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual production and sales (units)</td>
<td>20 000</td>
<td>40 000</td>
</tr>
<tr>
<td>Total costs per unit</td>
<td>£20</td>
<td>£40</td>
</tr>
<tr>
<td>Selling prices per unit (25% on cost)</td>
<td>£25</td>
<td>£50</td>
</tr>
<tr>
<td>Machining time per unit (hours)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Potential demand at above selling prices (units)</td>
<td>30 000</td>
<td>50 000</td>
</tr>
</tbody>
</table>

Fixed costs were £480 000 for the year, absorbed on machining hours which were fully utilized for the production achieved.

A new Managing Director has been appointed and he is somewhat sceptical about the plan being proposed. Furthermore, he thinks that additional machining capacity should be installed to remove any production bottlenecks and wonders whether a more flexible pricing policy should be adopted.

Table 2 summarizes the changes in costs involved for the extra capacity and gives price/demand data, supplied by the Marketing Department, applicable to the conditions expected in the next period.

Table 2: Costs

Extra machining capacity would increase fixed costs by 10% in total. Variable costs and machining times per unit would remain unchanged.

<table>
<thead>
<tr>
<th>Product</th>
<th>Alpha</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price/demand data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price range (per unit)</td>
<td>£20–30</td>
<td>£45–55</td>
</tr>
<tr>
<td>Expected demand (000 units)</td>
<td>45–15</td>
<td>70–30</td>
</tr>
</tbody>
</table>

You are required to

(a) calculate the plan to maximize profits for the coming year based on the data and selling prices in Table 1; (7 marks)

(b) comment on the pricing system for the existing plan used in Table 1; (3 marks)

(c) calculate the best selling prices and production plan based on the data in Table 2; (7 marks)

(d) comment on the methods you have used in part (c) to find the optimum prices and production levels. (3 marks)

Any assumptions made must be clearly stated. (Total 20 marks)
Nuts plc produces alpha and beta in two stages. The separation process produces crude alpha and beta from a raw material costing £170 per tonne. The cost of the separation process is £100 per tonne of raw material. Each tonne of raw material generates 0.4 tonne of crude alpha and 0.6 tonne of crude beta. Neither product can be sold in its crude state.

The refining process costs £125 per tonne for alpha and £50 per tonne for beta; no weight is lost in refining. The demand functions for refined alpha and refined beta are independent of each other, and the corresponding price equations are:

\[ P_A = 1250 - \frac{100Q_A}{32} \]

\[ P_B = 666 + \frac{100Q_B}{18} \]

where \( P_A \) = price per tonne of refined alpha
\( P_B \) = price per tonne of refined beta
\( Q_A \) = quantity of refined alpha
\( Q_B \) = quantity of refined beta

The company is considering whether any part of the production of crude alpha or crude beta should be treated as a by-product. The by-product would be taken away free of charge by a large-scale pig farming enterprise.

Requirements

(a) If all the output of the separation process is refined and sold:
   (i) calculate the optimal quantity of raw material to be processed and the quantities and prices of the refined products, and (10 marks)
   (ii) determine the ‘major’ product which is worth refining and the ‘minor’ product which deserves consideration as a potential by-product, but do not attempt to calculate at this stage how much of the ‘minor’ product would be refined.

(b) Calculate:
   (i) the optimal quantity of the ‘major’ product which would be worth producing regardless of the value of the ‘minor’ product, and (6 marks)
   (ii) the quantity of the resulting ‘minor’ product that would be worth refining.

(c) Evaluate the principal methods and problems of joint-cost allocation for stock valuation, referring to Nuts plc where appropriate. (9 marks)

Total 25 marks

ICA EW P2 Management Accounting

Pricing Decisions and Profitability Analysis
Cassidy Computers plc sells one of its products, a plug-in card for personal computer systems, in both the UK and Ruritania. The relationship between price and demand is different in the two markets, and can be represented as follows:

- **Home market:** Price (in £) = 68 – 8Q
- **Export market:** Price (in $) = 110 – 10Q

where \( Q_1 \) is the quantity demanded (in 000) in the home market and \( Q_2 \) is the quantity demanded (in 000) in the export market. The current exchange rate is 2 Ruritanian dollars to the pound.

The variable cost of producing the cards is subject to economies of scale, and can be represented as:

Unit variable cost (in £) = 19 – \( Q \) (where \( Q = Q_1 + Q_2 \)).

### Requirements

(a) Calculate the optimum selling price and total contribution made by the product if it can be sold

- (i) only in the home market
- (ii) only in the export market
- (iii) in both markets. (10 marks)

(b) Calculate the optimum selling prices and total contribution made by the product if it can be sold in both markets, but subject to a constraint imposed by the Ruritanian government that the company can sell no more cards in Ruritania than it sells in its home market. How sensitive are the prices to be charged in each market and the total contribution, to changes in the exchange rate over the range $1=£0.25 to $1=£1.00? (8 marks)

(c) How does the volatility of foreign exchange rates affect the ways in which export sales are priced in practice? (7 marks)

**ICAEW P2 Management Accounting**