Production Budgeting.

2008 Q.9

Intro.

Production budgeting comes up in the 'Management Accounting' section of the Leaving Cert Paper and is therefore a relatively short question that you would only have 30 minutes to complete. Whenever this has appeared on either a leaving cert paper or a mock exam, we've always been asked to do the same four or five things. Once you've mastered one of these questions therefore, you've pretty much mastered them all. The solution below deals with the 2008 question (question 9).

**(A)**

The first thing we are asked to do is to calculate the 'Production Budget'. In simple English this means working out 'How many products the company needs to make this year'. The good news is that this is a really simple thing to do. There are three steps:

   1. Find out how many products the company intends to *sell*. In this question they will be selling…
   Super: 10,000 units          Supreme:      4,200 units

   2. Subtract the opening stock of these products (because if we already have some of the products we obviously won't need to make them again). So now we have…

| Super: | 10,000 units | Supreme: | 4,200 units |
|---|---|---|---|
| O.Stock: | (600) | O.Stock: | (450) |
|  | 9,400 |  | 3,750 |

   3. Finally we add the closing stock (because if the company only makes the 9,400 and 3,750 above, they'll have nothing left at the end of the year). Since they told us they *do* want to have products left over at the end of the year (i.e. 'Closing Stock'), we need to add this amount on. So now we have…

   PRODUCTION BUDGET.

| Super: | 10,000 units | Supreme: | 4,200 units |
|---|---|---|---|
| O.Stock: | (600) | O.Stock: | (450) |
| C.Stock: | 480* | C.Stock: | 360* |
| | **9,880 units** | | **4,110 units** |

\* You might be wondering where I got the figures for closing stock. If you look at the third line of the question it says that 'all stocks are to be reduced by 20% from their opening levels' by the end of the year. So once they tell us the figures for opening stock, we're expected to know that the closing stock will be 20% less than this.

**(B)**

Next, we're asked to do a 'Raw Materials Purchase Budget'. In simple English this means we're being asked to work out 'How many raw materials this company needs to buy'. Again, there are three steps here…

1. Work out how many kilograms of raw materials we need to make each of our products. If you see the little table in the middle of the question, it tells us how many kilograms of each raw material are needed to make *one* product. So to make one Super product for example, we need 7kgs of Material X and 6kgs of Material Y. The problem is though, we're not making *one* Super product. If you remember from part (A) above, we are actually going to make 9,880 Super products. So we actually need to buy…

| | Material X | Material Y |
|---|---|---|
| Super | 7kg x 9,880 = 69,160kg | 6kg x 9,880 = 59,280kg |

If we use the same logic for our Supreme products, we can see from the question that we need 5kgs of Material X and 8kgs of Material Y to make *one* Supreme product. But we're not making *one* Supreme product – We're making 4,110 of them! (see the answer to question (A) above). So to know how many raw materials we need to make all the Supreme products we do the same as we just did for the Super products…

| | Material X | Material Y |
|---|---|---|
| Supreme | 5kg x 4,110 = 20,550kg | 8kg x 4,110 = 32,880kg |

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And fantastically if we stick the two tables together we can see in total how many kgs of Material X and Y we need in order to make the 9,880 units of Super and the 4,110 units of Supreme:

|         | Material X              | Material Y              |
|---------|-------------------------|-------------------------|
| Super   | 7kg x 9,880 = 69,160kg  | 6kg x 9,880 = 59,280kg  |
| Supreme | 5kg x 4,110 = 20,550kg  | 8kg x 4,110 = 32,880kg  |
| Total   | 89,710kg                | 92,160kg                |

So we've just worked out how many kilograms of each raw material the company needs this year. But don't forget that there may be opening stock of raw materials (which we therefore won't have to buy because we have it already) and closing stock of raw materials (which we'll need to add on because we want to have it left over at the end of the year). And just like in question (A), the opening stock will be clearly given to us in the question and the closing stock will be 20% less than the opening stock (because the third line from the top of the question said that '*All* stocks are to be reduced by 20%'). So now we have…

|         | Material X              | Material Y              |
|---------|-------------------------|-------------------------|
| Super   | 7kg x 9,880 = 69,160kg  | 6kg x 9,880 = 59,280kg  |
| Supreme | 5kg x 4,110 = 20,550kg  | 8kg x 4,110 = 32,880kg  |
| Total   | 89,710kg                | 92,160kg                |
|         |                         |                         |
| O.Stock | (5000) kg               | (3000) kg               |
| C.Stock | 4000kg                  | 2400kg                  |
|         |                         |                         |
| Total   | 88,710kg                | 91,560kg                |

And that's how many kilograms of each raw material we have to buy.

Be careful though because the question asked us to do the budget *in units* (which we've just done) *and in €*. This just means telling them how much it's going to cost to buy the kilograms we've worked out above. Luckily the question clearly tells us

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the expected price for raw materials during the year (€3 and €5).  So now we can work out the cost…

RAW MATERIALS PURCHASE BUDGET.

|  | Material X | Material Y |
|---|---|---|
| Super | 7kg x 9,880 = 69,160kg | 6kg x 9,880 = 59,280kg |
| Supreme | 5kg x 4,110 = 20,550kg | 8kg x 4,110 = 32,880kg |
| Total | 89,710kg | 92,160kg |
|  |  |  |
| O.Stock | (5000) kg | (3000) kg |
| C.Stock | 4000kg | 2400kg |
|  |  |  |
| Total | **88,710kg** | **91,560kg** |
|  | x €3 | X €5 |
|  | € 266,130 | € 457,800 |
|  |  |  |
|  | €266,130 + €457,800 = | **€ 723,930** |

**(C)**

Next up we're asked to work out the 'Production Cost / Manufacturing Budget'.  This means that they want to know not just what the raw materials will cost (which we worked out in part (B)), but what the *total* costs for the company will be – in other words, the raw materials *plus* any other costs.  This is actually pretty straightforward but there's one mistake people make over and over.  I've tried to clear it up in the following box…

Right, here's the thing.  In every topic in accounting (think of final accounts, incomplete records, club accounts, etc. for example) we deal with opening and closing stock the same – we always add opening stock and minus closing stock.  BUT HANG ON! Didn't we just do the complete opposite in questions (A) and (B) above?  Yes we did, and that's because the first two parts of production budgets (i.e. the bits we just did) are the exceptions in terms of how to deal with stock.

The reason for the difference is that in questions (A) and (B) of production budgeting we're not really dealing with *money*.  Part (A) was asking us how many *Products* we need to make and Part (B) was asking us how many *Raw Materials* we need to buy.

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Hopefully it makes sense to you that every other time we'll ever deal with opening or closing stock in accounting (either for the rest of this question or in any other topic), we *will* be dealing with money and will therefore be using the normal rule of adding opening stock and minusing closing stock.

This is the big thing that people mess up in production budgets therefore. They tend to deal with stock the same way throughout the whole question rather than remembering that we need to do it the unusual way in questions (A) and (B), and then switch back to the normal way after that.

So to answer part (C) then, we just add all of the costs up (starting with the cost of raw materials, which we pretty much worked out from part (B)). First off let's get the raw materials bit right…

| Cost | *Workings* | € | € |
|------|-----------|---|---|
| Raw Materials | *Total Cost (Answer to Q.B)* | 723930 | |
| Plus Opening Stock | *5000kg x €2.50* | | |
| | *3000kg x €4.50* | 26000 | |
| Minus Closing Stock | *4000kg x €3* | | |
| | *2400kg x €5* | -24000 | 725930 |

You'll notice we started with the answer to Part (B), which was the cost of raw materials. Then we go back to the normal way of accounting, where we add opening stock and minus closing stock. Since we're back dealing with money here, it's not just the *units* of stock that concern us – it's the *value* of them. That's why the opening stock of raw materials is the kilograms multiplied by the price that they gave us in the question.

To find the closing stock we know first of all that the units go down by 20% (so the kilograms are 4,000 and 2,400 instead of the 5,000 and 3,000 we had at the start of the year). If we used the same price as we were given at the start of the year we'd be incorrect though, because you might remember that the price of raw materials during

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the year was different from the price at the start of the year.  We always assume that the stuff we bought at the cheaper price at the start of the year will have been used first and that the things we have left over at the end of the year should therefore be valued at what they cost us – i.e. the price we had to pay *during* the year (€3 and €5).

Other than raw materials there are three separate costs.  You'll see a mention of 'Skilled Labour' in two places in the question.  We're told how many hours of skilled labour it takes to make each product (7 hours to make one Super product and 8 hours to make one Supreme product) and we're told down near the bottom that the price for skilled labour is €13 per hour.  So the cost of labour will be:

*Hours to make 1 product x No. of products being made x Hourly cost.*

Super = 7 Hours x 9,880 Products x €13 Per Hour:          €899,080
Supreme = 8 Hours x 4,110 Products x €13 Per Hour:       €427,440

And now our budget looks like this…

| Cost | *Workings* | € | € |
|---|---|---|---|
| Raw Materials | *Total Cost (Answer to Q.B)* | 723930 | |
| *Plus Opening Stock* | 5000kg x €2.50 | | |
| | 3000kg x €4.50 | 26000 | |
| *Minus Closing Stock* | 4000kg x €3 | | |
| | 2400kg x €5 | -24000 | 725930 |
| Skilled Labour | 7hrs x 9,880 x €13 | 899080 | |
| | 8hrs x 4,110 x €13 | 427440 | 1326520 |

There are just two more costs in the question and they're both easy to add in.  If you look at the bottom of the question you'll see that Variable Costs are €4 per labour hour.  This just means that we have some extra expenses and they cost us €4 for every hour that we're working.  It's worked out almost exactly like we worked out the

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skilled labour, but instead of putting in €13 an hour like we did for labour, we put in €4 an hour to get the variable costs. So it's:

Super = 7 Hours x 9,880 Products x €4 Per Hour:    €276,640

Supreme = 8 Hours x 4,110 Products x €4 Per Hour:€131,520

And finally, the very last line of the question tells us that there's a Fixed Cost (i.e. 'fixed' meaning we don't have to work anything out) of €204,080. We just put this in as it is. This gives us the final list of costs and therefore the answer to Part (C)…

COST OF MANUFACTURE BUDGET.

| Cost | Workings | € | € |
|---|---|---|---|
| Raw Materials | Total Cost (Answer to Q.B) | 723930 | |
| Plus Opening Stock | 5000kg x €2.50 | | |
| | 3000kg x €4.50 | 26000 | |
| Minus Closing Stock | 4000kg x €3 | | |
| | 2400kg x €5 | -24000 | 725930 |
| Skilled Labour | 7hrs x 9,880 x €13 | 899080 | |
| | 8hrs x 4,110 x €13 | 427440 | 1326520 |
| Variable Overheads | 7hrs x 9,880 x €4 | 276640 | |
| | 8hrs x 4,110 x €4 | 131520 | 408160 |
| Fixed Overheads | Given in question | | 204,080 |
| Total Costs | | | **2664690** |

**(D)**

The last bit of accounting we need to do is a brief Trading Account for the company. This only needs us to work out four figures – Sales, Purchases, Opening Stock and Closing Stock. Remember, what we're talking about here is *Finished Products*. In

part (C) when we talked about stock for example it was *Raw Materials*.  So let's see where we get each of the four figures…

Sales will be: The amount of products we think we're going to sell (10,000 and 4,200) multiplied by the selling price of each one (given to us in the second line of the question - €220 and €260).

Purchases will be: The answer to Part (C).  This company doesn't *purchase* its stock, they *make it*.  Therefore the figure for Purchases in their Trading Account should actually be the figure for 'Cost of Manufacture', i.e. €2,664,690.

Opening Stock will be: The opening stock of finished goods on the 1/1 that's given to us in the question (600 x €120, and 450 x €140).

Closing Stock will be: The units of closing stock finished goods we have will be 20% less than what we had at the start of the year (because we were told in the question that all our stocks go down by 20% by the end of the year).  So instead of having 600 Supers and 450 Supremes, we'll have 480 and 360.  The question is therefore how much are they worth.  Fortunately we don't have to worry about this because if you look down at the very bottom of the question to what it says in brackets after question (d), you'll see that they actually tell us this.  We're told here that a closing stock unit of Super is valued at €180 and a Supreme is €210)

And therefore the answer is…

TRADING ACCOUNT.

|  | € | € | € |
|---|---|---|---|

| | | |
|---|---|---|
| Sales *(10,000 x €220) + (4,200 x €260)* | | 3292000 |
| Purchases | 2664690 | |
| Op.Stock *(600 x €120) + (450 x €140)* | 135000 | |
| Cl.Stock (480 x €180) + (360 x €210) | <u>-162000</u> | |
| | <u>2637690</u> | <u>2637690</u> |
| Gross Profit | | **654310** |

## E.

There's two quick bits of theory at the end of this question.

i) A Capital Budget is the budget (i.e. the planned income and expenditure) that relates to large projects such as the purchase of a new building or the sale of part of the company. Decisions about capital projects are generally made at very high levels within the firm and may often result in a need to raise finance in order to cover potential purchases.

ii) This is the element that restricts the firm from expanding indefinitely. This might normally be the sales demand for the product but might also be the production capacity of the factory or the availability of capital.