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Product / Stock / Absorption Costing.

2010 Question 8.

Question 8 on the Leaving Cert exam is generally a Costing option and a few possible varieties can come up here. If you are good at Maths the 'Marginal Costing' option will probably suit you best and if you go back to my notes page you'll find a full explanation of one of these questions.

The other types of costing that normally come up are 'Product Costing', 'Stock Costing' and 'Absorption Costing'. These are all small topics so normally two of them will appear (one of them as part 'A' of the question and one as part 'B'). Luckily the 2010 question actually included a bit of all three options so here's the answer explained...

(A) Stock.

Stock costing (valuation) is really easy and just needs the ability to add and subtract pretty much. The first step is to add up all the stock we bought and to subtract all the stock we sold. Here it is for the 2010 question:

Stock we purchased:

| | | |
|------------------------|---|----------------|
| 3000 units x €4 | = | €12,000 |
| 2200 units x €6 | = | €13,200 |
| <u>1500 units x €7</u> | = | <u>€10,500</u> |
| <u>6700 units</u> | | <u>€35,700</u> |

Stock we sold: (There's no difference between credit sales and cash sales for this topic so we just add them all together):

| | |
|-------------------------|------------------|
| 900 units x €9 = | €8,100 |
| 1100 units x €10 | = €11,000 |
| 1200 units x €10 | = €12,000 |
| 1200 units x €11 | = €13,200 |
| 1300 units x €12 | = €15,600 |
| <u>1200 units x €13</u> | = <u>€15,600</u> |
| <u>6900 units</u> | <u>€75,500</u> |



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Now the question is basically asking us how much the stock we have at the end of the year (i.e. the closing stock) is worth. You might notice in the question that we are given an opening stock figure of 4,000 units at €4 each. So to work out how much closing stock we have....

...Add the number of units we purchased (6,700) to the number of units we had at the start of the year (4,000) and then minus the number of units we sold during the year (6,900). This obviously gives us the number of units we have left at the end of the year: 3,800 units.

...Next we have to see how much this closing stock is worth in money terms. This is the only slightly technical thing you need to know. The gist of it is actually written in the question (look at question (i) and it says to calculate the value of the closing stock “**using First In/First out method**”). This little part of the sentence is telling us how we can determine the value of the 3,800 units we have left at the end of the year. Any idea how you would decide what those 3,800 were worth if you were asked? There’s loads of numbers in the question that might help and so you might come up with loads of different theories. Maybe you would multiply the 3,800 by the €4 we were told the opening stock was worth? Or would you use one of the prices we bought stock for during the year? Or maybe even one of the prices we sold stock for during the year?

If you did any of those things though, you’d be wrong! Here’s what happens – First of all the basic rule is that stock is valued at cost price, so we can ignore all the prices that we *sold* stock for this year. That leaves us with the three prices we *purchased* stock for this year (remember these from earlier in the answer?): But which of these do we use?

01/01/2009: 3000 units x €4
01/05/2009: 2200 units x €6
01/09/2009: 1500 units x €7

The answer is that we actually use all of them! Here’s why: When we are told that stock is to be valued using the ‘First In/First Out’ method it means we should value stock at the most recent cost price (which as you can see from above is €7). But you might also notice that we only bought 1,500 units at €7 so it wouldn’t make sense to value all 3,800 units of our closing stock at €7.

That’s why we then go to *the next most recent purchase price* (€6). But we only purchased 2,200 units at that price and therefore that still doesn’t cover the 3,800 units



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we are trying to value. In other words, if we value 1,500 of them at €7 and 2,200 of them at €6, that still only comes to 3,700 units (and we need to value 3,800 units). Any idea what we do? Hopefully you thought about going to *the next most recent price* (€4) and valuing the last 100 units at this price. So the value of closing stock is...

$$\begin{array}{rcl} 1,500 \text{ units} \times \text{€}7 & = & \text{€}10,500 \\ 2,200 \text{ units} \times \text{€}6 & = & \text{€}13,200 \\ 100 \text{ units} \times \text{€}4 & = & \text{€}400 \\ & & \underline{\text{€}24,100} \end{array}$$

It might take a minute to get your head around it but it's really easy and shouldn't be a problem after you've played around with in your head for a little while. Interestingly if we had been told to value stock using the 'Last In/First Out' method, any idea what we would have done? Well first of all, it's unlikely you would be asked this because it rarely happens in real life but if you were asked, simply do the valuation procedure backwards – i.e. use the cost of the *oldest* purchase first (the €4 in this case), then go to the *next oldest* and so on. If we had been asked to do that in this question, we would have gotten a different answer and a different valuation for the closing stock...

$$\begin{array}{rcl} 3,000 \text{ units} \times \text{€}4 & = & \text{€}12,000 \\ 800 \text{ units} \times \text{€}6 & = & \text{€}4,800 \\ & & \underline{\text{€}16,800} \end{array}$$



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Don't forget there was also a part (ii) which asked us to do a trading account. Here it is...

Trading Account for The Year Ended 31/12/09

| | € | € | € |
|---------------|---|---------------|--------------|
| Sales | | | 75500 |
| Opening Stock | | 16000 | |
| Purchases | | 35700 | |
| Closing Stock | | <u>-24100</u> | <u>27600</u> |
| Gross Profit | | | <u>47900</u> |

Are you happy you know where everything comes from in that trading account? The sales is simply the total of the sales that we worked out at the very top of the answer. The purchases is the exact same. The opening stock is the 4,000 units x €4 that we were told in the question and the closing stock is the answer to the valuation of closing stock that we spent a few minutes working out above.

Easy!

(B) Product.

In product costing we are obviously trying to work out what a particular product costs to produce. The question will give us the various costs and we simply add them up. So here we go...

The first thing we are given is a list of the hourly variable, fixed and wage costs for each department. A few lines below that you'll see a little list of how many hours each department will work for on this job. Put these two bits of info together and we get the following...



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| <u>Calculation of Product Cost</u> | € | € |
|------------------------------------|-------------|------|
| <u>Variable Costs</u> | | |
| Dept A (€15 x 95 Hours) | 1425 | |
| Dept B (€17 x 185 Hours) | 3145 | |
| Dept C (€22 x 60 Hours) | <u>1320</u> | |
| | <u>5890</u> | 5890 |
| <u>Fixed Costs</u> | | |
| Dept A (€6 x 95 Hours) | 570 | |
| Dept B (€5 x 185 Hours) | 925 | |
| Dept C (€4 x 60 Hours) | <u>240</u> | |
| | <u>1735</u> | 1735 |
| <u>Wages</u> | | |
| Dept A (€13 x 95 Hours) | 1235 | |
| Dept B (€15 x 185 Hours) | 2775 | |
| Dept C (€10 x 60 Hours) | <u>600</u> | |
| | <u>4610</u> | 4610 |

Now there are a couple of other costs mentioned so all we need to do is add these on as well. First of all we're told that 'General Administration overhead absorption rate per hour is budgeted to be €5.50'. This sounds confusing but is really easy. It just means that we need to add a charge of €5.50 per hour for the *total number of hours all three departments will be working*. In other words we add the 95,185 and 60 hours each department is working (to get a total of 340 hours) and then multiply this by €5.50. €1,870



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Finally, you'll see we're told that material costs are expected to be €7,350 so we add this to all our costs as well. And that gives us the total cost of Job No. 209...

| <u>Calculation of Product Cost</u> | € | € |
|--|-------------|-------|
| <u>Variable Costs</u> | | |
| Dept A (€15 x 95 Hours) | 1425 | |
| Dept B (€17 x 185 Hours) | 3145 | |
| Dept C (€22 x 60 Hours) | <u>1320</u> | |
| | <u>5890</u> | 5890 |
| <u>Fixed Costs</u> | | |
| Dept A (€6 x 95 Hours) | 570 | |
| Dept B (€5 x 185 Hours) | 925 | |
| Dept C (€4 x 60 Hours) | <u>240</u> | |
| | <u>1735</u> | 1735 |
| <u>Wages</u> | | |
| Dept A (€13 x 95 Hours) | 1235 | |
| Dept B (€15 x 185 Hours) | 2775 | |
| Dept C (€10 x 60 Hours) | <u>600</u> | |
| | <u>4610</u> | 4610 |
| General Administration Overhead (€5.50 x 340 Hours) | | 1870 |
| Materials | | 7350 |
| Total Cost of Job No.209 | | 21455 |

Finally, don't forget that the question didn't actually ask us to find the *cost* price of the job, but in fact the *selling* price. The last bit of info they gave us was that 'the profit is 20% of the selling price'. We're expected to know that if the profit is 20% of



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selling price, then the costs must make up the other 80% of selling price (imagine selling something for €1 and knowing that 20c of that was your profit. What would the other 80c be? It would be the cost you incurred buying or making the item in the first place).

So in this case our total cost of €21,455 (which we just worked out above) is 80% of the selling price, so if we divide it by 80 and multiply by 100 we get the selling price: €26,818.75

Brilliant!

C) Absorption.

The last part of the 2010 question is to do with 'Absorption Costing'. This is essentially to do with finding an hourly cost rate for each department. For example if you look under the 'Budgeted' heading you'll see the costs that the company *expected* to have for the year. We first of all need to turn the total figures for each department into hourly rates. So...

Dept X Total: €140,000 divided by either Labour Hours or Machine Hours. e.g. Let's use machine hours (you can use either but the important thing to remember is to stick to the one you pick as you go through the rest of the question). €140,000 divided by 35,000 Machine Hours = €4 per Machine hour.

Dept Y Total: €36,000 divided by 45,000 Labour Hours = €0.80c per Labour hour (again, you could have picked machine hours if you wanted).

Dept Z Total: €40,000 divided by 20,000 Labour Hours (we didn't have machine hours for this department so there was no choice what to divide the cost by this time) = €2 per Labour hour.

And that's part (i) answered!

Next we just need to compare these *predicted* figures with then what *actually happened*. Look at the figures under the 'Actual' heading and you'll see how many Labour and Machine hours there actually were. Simply multiply the hourly rates we worked out above by the number of hours that actually occurred. i.e.



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Dept X: €4 per Machine Hour x 40,000 Machine Hours: €160,000

Dept Y: €0.80c per Labour Hour x 37,000 Labour Hours: €29,600

Dept Z: €2 per Labour Hour x 25,000 Labour Hours: €50,000

So with that done we're ready to answer part (ii) of the question. The three figures we've just worked out are basically the total costs we should have expected to see based on the hourly rate we had predicted. For example we thought that Dept X would cost us €4 per Machine Hour and there were 40,000 Machine hours, so the cost we expected to pay was €160,000. But if you look under the 'Actual' heading you'll see that we actually paid €155,000. We therefore over-budgeted (or 'Over Absorbed') by €5,000. Part (ii) is asking us to show this difference for each department and to say what it means.

Dept X:

Budgeted €160,000, Actual €155,000 = €5,000 Over Absorption.

This means that costs were €5,000 less than expected and therefore profits are €5,000 more than expected.

Dept Y:

Budgeted €29,600, Actual €30,000 = €400 Under Absorption.

This means that costs were €400 more than expected and therefore profits are €400 less than expected.

Dept Z:

Budgeted €50,000, Actual €45,000 = €5,000 Over Absorption.

This means that costs were €5,000 less than expected and therefore profits are €5,000 more than expected.

Total:

Budgeted €239,600, Actual €230,000 = €9,600 Over Absorption.

This means that overall costs were €9,600 less than expected and therefore profits are €9,600 more than expected.

And that's it!