# COST ACCOUNTING AND QUANTITATIVE ANALYSIS

## Foundation stage examination
## 8 December 1999

From 10.00 am to 1.00 pm
plus ten minutes reading time from 9.50 am to 10.00 am.

***Instructions to candidates***

*Answer **four** questions in total: All questions carry equal marks.*

*All workings should be shown. Where calculations are required using formulae, calculators may be used but steps in the workings must be shown. Calculations with no evidence of this (for example, using the scientific functions of calculators) will receive no credit. Programmable calculators are not permitted in the examinations room.*

*Formula sheets, statistical tables, graph paper and cash analysis paper are available from the invigilator, where applicable.*

**1** Putting Aid Ltd manufactures a small plastic putting aid for high handicap golfers. The company is considering reducing the price of the putting aid in order to boost sales. You have been asked to provide advice to the directors of the company as part of your organisation's support to the small business sector.

The production records, indicating the number of units produced and sold and their costs over the last five years, are as follows :

| Year | Units 000s | Direct Materials £000 | Direct Labour £000 | Production Overhead £000 | Sales Revenue £000 |
|---|---|---|---|---|---|
| 1994 | 33 | 46.2 | 132 | 116 | 297 |
| 1995 | 27 | 37.8 | 108 | 104 | 243 |
| 1996 | 20 | 28.0 | 80 | 90 | 180 |
| 1997 | 30 | 42.0 | 120 | 110 | 270 |
| 1998 | 40 | 56.0 | 160 | 130 | 360 |

All costs have been adjusted to the current year price base, so inflation can be ignored.

Production overheads include fixed and variable elements.

The directors believe that reducing the price of the putting aid by 10% will boost sales to 45,000 units per year, and that all unit and fixed costs will be unchanged at that level of production and sales.

- **Requirement for question 1**

(a) Determine the fixed and variable elements of the production overheads by using least squares regression analysis. *8*

(b) Determine the current break even point in both units and sales revenue. *3*

(c) Establish the 95% confidence limits for the number of units that will be sold in 1999, assuming that the selling price remains unchanged in real terms. As the sample size is small the 't' distribution should be used. *8*

(d) Advise the directors, with supporting calculations, whether or not the reduction in price would be beneficial to the company. *6*

*(25)*

**2**

ProAm Ltd manufactures two products, the Hook and the Slice. Production and Sales data for the months of April and May 1999 is set out below.

| | **April 1999 Hook - units** | **April 1999 Slice - units** | **May 1999 Hook - units** | **May 1999 Slice - units** |
|---|---|---|---|---|
| Production | 14,000 | 7,000 | 17,000 | 5,000 |
| Sales | 10,000 | 5,000 | 18,000 | 6,500 |

There were no stocks of either product as at 1 April 1999.
Cost and selling price information is as follows:

| **Item** | **Hook £ per unit** | **Slice £ per unit** | **Total £** |
|---|---|---|---|
| Selling Price | 20.00 | 30.00 | |
| Direct Materials | 7.00 | 14.00 | |
| Direct Labour | 5.00 | 2.50 | |
| Variable Production Overhead | 1.50 | 1.00 | |
| Variable Selling and Distribution Overhead | 3.00 | 2.00 | |
| Fixed Costs per month: | | | |
| Production | | | 45,000 |
| Administration | | | 10,000 |
| Sales and Distribution | | | 20,000 |

The Company produces monthly profit statements using marginal costing principles. The statements for April and May are set out below:

**Marginal Costing Statement**

| | **April** | | | **May** | | |
|---|---|---|---|---|---|---|
| | **Hook £** | **Slice £** | **Total £** | **Hook £** | **Slice £** | **Total £** |
| Sales Revenue | 200,000 | 150,000 | 350,000 | 360,000 | 195,000 | 555,000 |
| Direct Costs | | | | | | |
| Materials | 98,000 | 98,000 | 196,000 | 119,000 | 70,000 | 189,000 |
| Labour | 70,000 | 17,500 | 87,500 | 85,000 | 12,500 | 97,500 |
| Variable Production Overhead | 21,000 | 7,000 | 28,000 | 25,500 | 5,000 | 30,500 |
| Opening Stock | - | - | - | 54,000 | 35,000 | 89,000 |

| | April | | | May | | |
|---|---|---|---|---|---|---|
| | **Hook** | **Slice** | **Total** | **Hook** | **Slice** | **Total** |
| | **£** | **£** | **£** | **£** | **£** | **£** |
| Closing Stocks | 54,000 | 35,000 | 89,000 | 40,500 | 8,750 | 49,250 |
| Variable Production cost | 135,000 | 87,500 | 222,500 | 243,000 | 113,750 | 356,750 |
| Variable selling and distribution | 30,000 | 10,000 | 40,000 | 54,000 | 13,000 | 67,000 |
| Total variable cost | 165,000 | 97,500 | 262,500 | 297,000 | 126,750 | 423,750 |
| Contribution | 35,000 | 52,500 | 87,500 | 63,000 | 68,250 | 131,250 |
| Fixed Production Cost | | | 45,000 | | | 45,000 |
| Selling and Distribution | | | 20,000 | | | 20,000 |
| Administration | | | 10,000 | | | 10,000 |
| Profit | | | 12,500 | | | 56,250 |

The Company is considering an alternative monthly profit statement using absorption costing principles. If this alternative is adopted the Company would recover fixed production overheads using a percentage addition to labour cost based on a budgeted monthly production of 15,000 units of Hook and 6,000 units of Slice. It would also calculate the under or over recovery of fixed production overheads every month for both products, and show these in the monthly profit statements.

- **Requirement for question 2**

(a) Prepare the alternative profit statements for the months of April and May 1999 using Absorption costing principles. *18*

(b) Prepare a statement reconciling the profits obtained from the two methodologies. *2*

(c) Explain how the Cost Accountant could use the information obtained from preparing the monthly profit statements. *5*

*(25)*

**3** Cut and Thrust Ltd manufactures and supplies medical equipment to NHS Trust Hospitals. The company uses standard absorption costing for all its budgeting and budgetary control procedures.

| Item | Cost and amount | Amount needed per combisplint |
|---|---|---|
| Padding | £0.50 per gram | 10 grams |
| Gauze bandage | £1.00 per metre | 5 metres |
| Part 107 | £15.00 each | 1 unit |
| Medical Technicians | £7.50 per hour | 2 hours |
| Laboratory Technicians | £5.00 per hour | 3 hours |

The Annual Budget is based upon estimated production and sales of 24,000 combisplints, with no change in stock levels.

Actual results for the month of April, the first in the financial year, when 1,750 combisplints were made and sold, are set out below:

| Cost Item | Quantity purchased | Cost |
|---|---|---|
| Padding | 20,000 grams | £9,000 |
| Gauze bandage | 9,500 metres | £9,975 |
| Part 107 | 1,800 | £27,000 |
| Medical Technicians | 3,400 hours | £25,840 |
| Laboratory Technicians | 5,400 hours | £25,650 |

There was no change in stocks of combisplints during the month.

- **Requirement for question 3**

(a) Prepare the standard cost card for one combisplint. *5*

(b) Outline the different types of standard which could be used. *2*

(c) Prepare the Annual Budget for expected production and sales of 24,000 combisplints. *5*

(d) Determine all the materials and labour variances for the month of April. *8*

(e) Identify one possible reason for each of the variances. *5*

*(25)*

**4** The Lock is a small arts theatre, with a maximum capacity of 400 seats, run by the Leisure Services Department of Hamlet District Council. The Director of Leisure Services is considering a proposal to put on seven performances of Martin Quinn's controversial cult play "The Electric Tangerine".

As Leisure Services Assistant Committee Accountant you have been detailed to carry out a financial appraisal of the proposal. Your analysis of the information provided for you by the Theatre Manager yields the following price and demand probability information.

| Price | Number of seats sold | Probability of Demand |
|---|---|---|
| £20.00 | 250 | 0.6 |
| | 275 | 0.3 |
| | 375 | 0.1 |
| £18.00 | 275 | 0.2 |
| | 325 | 0.5 |
| | 375 | 0.3 |
| £17.50 | 350 | 0.1 |
| | 375 | 0.3 |
| | 400 | 0.6 |

In addition the Finance Department records reveal that usually productions of this sort incur:

(i) Variable costs of £6.00 per seat sold.

(ii) Fixed costs of £4,000 per performance, unless more than 350 seats are sold, in which case the need to employ extra staff increases the fixed costs to £5,000 per performance.

(iii) The contribution earned by the bar equates to £1.50 per seat sold.

- **Requirement for question 4**

(a) Estimate the profit at each probability of demand level. *10*

(b) Calculate the expected profit at each price level. *3*

(c) Assess, for each price level, the probability that a loss would be made on the performances. *3*

(d) State any reservations that you might have with regard to the probability figures and the results obtained. *5*

(e) Explain, giving appropriate examples, the meaning of the following terms:

(i) contribution earned;
(ii) fixed costs;
(iii) variable costs;
(iv) 0.1 probability of demand. *4*

*(25)*

5 SuperFin Ltd. manufactures food for domestic goldfish from high protein extract and vegetable oils in two processes. During December 1999 the following transactions took place:

| **Item** | **Process 1** | **Process 1** | **Process 2** | **Process 2** |
|---|---|---|---|---|
| | | **£** | | **£** |
| Material Added | 1,000 kg | 2,000 | 300 kg | 450 |
| Labour | | 4,200 | | 6,000 |
| Normal Loss | 10% | | 20% | |
| Output | 700 kg | | 850 kg | |
| Scrap Value of Losses | 50 pence per kilo | | 17 pence per kilo | |

The input to Process 1 is always 1,000kg. In an attempt to reduce the labour costs of this process, the number of labour hours dedicated to Process 1 have been reduced in recent months. The relevant figures for the last five monthly processes are as follows:

| **Month** | **Hours** | **Output (kg)** |
|---|---|---|
| August | 1,220 | 950 |
| September | 1,150 | 980 |
| October | 1,130 | 820 |
| November | 1,080 | 860 |
| December | 1,050 | 700 |

All Labour is paid £4.00 per hour. Overheads are charged to production at the rate of £1.00 per Direct Labour Hour.

- **Requirement for question 5**

(a) Prepare the Process Accounts for the month of December. *6*

(b) Prepare the Scrap Account, Abnormal Losses and Gains Accounts. *5*

(c) Provide four examples of industries that would prepare process cost accounts. *2*

(d) Calculate the coefficient of correlation between the hours worked on Process 1 and the level of output. *8*

(e) Explain the conclusions that could be drawn from the calculation in (d). *4*

*(25)*