

# COST ACCOUNTING AND QUANTITATIVE ANALYSIS

## **Foundation stage examination 12 June 2002**

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

Sharleena Supplies is a manufacturing company making a single component used in the computer industry. For a number of years it has existed with very rudimentary costing and management information systems but the recent appointment of a new member of the board, Ivor K Westian, has resulted in a dramatic change of emphasis. The following information regarding the last six months of production was sent to Ivor recently:

Month	Units produced and sold	Production Overheads
	000	£
1	20.5	7,200
2	21.6	7,600
3	21.2	7,400
4	22.3	7,900
5	24.2	8,200
6	24.6	8,400

As well as the production overheads the company also incurs general/non production overheads amounting to some £12,000 in a full year. The product uses direct materials which cost £4 for each unit produced, and the direct labour cost amounts to £5 for each unit produced.

Ivor has written with the following comments and questions:

“...It seems to me that production and sales are on an upward trend which will hopefully continue into the future. I would like to see some sort of analysis and projections on this. Just looking at the basic production figures for the six months, what would be the mean level of production? The figures for production overheads intrigue me! It would seem that the cost is broadly going up as the number of units made increases (though I would expect part of this would be a fixed cost) - perhaps this can be looked at too. I am not really an expert but I believe a technique called linear regression might be used. But I’m rather suspicious of statistics - you can prove anything with numbers!”

You have recently been appointed as trainee cost and management accountant at Sharleena Supplies and have been asked to produce the following analysis which will be incorporated into a response to Ivor.

• **Requirement for question 1**

- (a) Calculate the mean number of units produced. 2
- (b) Use linear regression to derive an equation of the form  $y = a + bx$  which can be used to estimate production overhead costs. 8

- (c) State what assumptions are made when using the least squares method of linear regression. 5
  - (d) Forecast, by adopting a six month moving average, the likely sales/production levels for the next three months (month 7 to month 9). 4
  - (e) Calculate the total cost of the forecast number of units in part (d) for the three months. 6
- (25)

# 2

Mid Counties University has developed an off-term business, catering for residents and conferences. It has four cost centres; Residential and Conferences deal with customers whilst Housekeeping and Maintenance are internal service cost centres. Overhead details for the next accounting period have been estimated as:

	<b>Total</b>	<b>Residential</b>	<b>Conference</b>	<b>Housekeeping</b>	<b>Maintenance</b>
	<b>£</b>	<b>£</b>	<b>£</b>	<b>£</b>	<b>£</b>
Consumable materials	82,000	16,000	26,000	29,000	11,000
Indirect staff costs	52,500	17,500	14,000	11,200	9,800
Rent & rates	37,500				
Insurance of contents	14,000				
Heat & light	18,500				
Depreciation of equipment	37,500				
	<u>242,000</u>				

The following information is also advised:

	<b>Residential</b>	<b>Conference</b>	<b>Housekeeping</b>	<b>Maintenance</b>
Floor area (m <sup>2</sup> )	2,750	1,350	600	300
Equipment value (£)	350,000	250,000	75,000	75,000
Number of employees	20	20	15	5

In the period it is estimated there will be 2,950 guest-nights and 12,000 conference delegate days. Work carried out by the service cost centres is estimated as:

	<b>Housekeeping</b>	<b>Maintenance</b>
	<b>%</b>	<b>%</b>
Residential	70	30
Conference	20	50
Maintenance	10	-
Housekeeping	-	20
	<u>100</u>	<u>100</u>

• **Requirement for question 2**

- (a) Prepare an overhead statement showing clearly the bases of apportionment. 8
- (b) Calculate appropriate overhead absorption rates for the residential and conference cost centres. The costs of the service cost centres are to be apportioned using the algebraic (simultaneous equations) method. 6

(c) State and explain briefly two other methods which could be used to reapportion reciprocal service costs. 4

(d) Calculate the total under/over recovery of overheads and causes thereof including amounts, for both centres, if actual results were:

Residential	3,000	guest nights with overheads of £144,000.	
Conference	11,600	conference delegate days with overheads of £98,600.	7

(25)

**3**

Incaroad is a manufacturer of components used in the ship-building industry. The company operates separate cost and financial accounting systems interlocked by control accounts in the two ledgers. At the beginning of the month just ended the following balances were recorded in the cost accounts:

	£	£
Raw materials stock	42,000	
Work in progress	85,000	
Finished goods	19,000	
Cost ledger control		146,000

The financial accounting department provided the following details of transactions for the month as follows:

- Raw materials amounting to £150,000 were purchased on credit.
- The stores section issued materials as follows: £60,000 of direct materials were issued to production and £20,000 of indirect materials were used.
- The total cost of wages for the month was £120,000 with £40,000 of this being indirect production labour and the balance being direct wages cost.
- Further production expenses of £35,000 were incurred in this period and there were administration expenses totalling £12,000.

Incaroad has an absorption costing system which uses predetermined overhead absorption rates. At the moment the base used is direct labour cost. The amount charged to jobs for the period just ended (based on direct labour cost) was £90,000.

The cost of work done and transferred to stocks of finished goods was £200,000 and the cost of goods taken from finished goods stock and delivered to customers amounted to £120,000. There were sales in the month valued at £250,000.

• **Requirement for question 3**

- (a) Open and complete the necessary cost accounts for the period just ended. 12
- (b) Explain the main differences between an integrated and interlocking system of cost accounts and describe briefly the advantages of each approach. 4
- (c) Give three examples of financial accounting transactions which would not be recorded in the cost accounts. 3
- (d) A subsidiary company of Incaroad is involved in building and civil engineering contract work. Explain the following terms used in contract costing:
  - (i) Progress payments.
  - (ii) Architect's certificate.
  - (iii) Retention money. 6

(25)

# 4

Purrfect Products is a company which produces tins of food for cats. The aim is to produce high price/low volume products which will attract “the more discerning owner”. One of the directors is responsible for the production side of the business together with the cost accounting function. Arthur Tiger recently commented: “...There are two things which concern me a lot at the moment. One is the behaviour of a lot of the costs which we incur. No one has ever thought about this and attempted to analyse cost behaviour for us. My second main worry is the Catty Chunks product line and especially the new filling machine that we bought recently. I am worried we might be contravening consumer legislation regarding weights of the tins...”

Firstly, with regard to cost behaviour, Arthur has asked that separate graphs are drawn for each of the following costs with axes clearly labelled and a brief description of the type of cost shown:

- (i) Supervision costs on the Catty Chunks product line. One supervisor is capable of supervising 10 workers – at present 30 workers are employed.
- (ii) Sales commission is paid to the sales team at a rate of 10% of the value of sales made.
- (iii) Catty Chunks production workers are paid a bonus if production exceeds 5,000 tins up to a maximum of 10,000 (the bonus being £0.10 per tin).
- (iv) Catty Chunks production machinery is covered by a maintenance contract which costs £500 per month plus £0.05 per tin produced.
- (v) The tin-labelling machine is hired from a specialist supplier. The agreement specifies a charge of £10 per hour used subject to a maximum charge of £150 in a week. (Any usage in excess of this is “free”).

With regard to Arthur’s concerns about the tin weights, the following information is available:

Each tin is supposed to weigh 450g. A recent sample of actual weights concluded that the standard deviation in weights produced by the filling machine is 8g. According to weights and measures legislation, if any tin is more than 22.5g under the stated weight the firm will be liable to prosecution. Arthur wants to know what mean filling weight the machine should be set to in order that there is only a very small chance of a tin being less than the legal minimum weight.

- **Requirement for question 4**

- (a) Draw a separate graph for each of the five costs mentioned above, indicating the axes of each graph clearly and giving a brief description of the type of cost the graph shows.

15

- (b) Calculate, assuming that the tin weights of Catty Chunks follow a normal distribution, what mean weight the machine should be set to so that there is only a 1% chance that the tin is legally underweight. 6
  - (c) Explain, when sampling, four properties of a good estimator. 4
- (25)



5

G. Wazoo is a firm which produces paints, varnishes and other related chemicals such as white spirit and turpentine. Most products pass through a number of stages and Wazoo uses a process costing system to record and control costs. One of the products passes through two separate stages before completion and the following information is available for the costing period just ended:

This product requires two chemicals in Process A – 1,000kg of Aythene and 500kg of Beethene. The chemicals require regular stirring and monitoring which incurs labour costs of £450. There are overhead costs on Process A which amount to 50% of the total materials costs.

Output from Process A is passed to Process B for further refining. A third chemical is added (500kg of Ceethene) and labour costs of £500 incurred. The overhead cost for Process B amounts to 118% of the labour cost.

The prices paid for the three chemicals were £2 per kg for Aythene, £3 per kg for Beethene and £4 per kg for Ceethene.

There is an expected normal loss on Process A of 10% of input, but with a scrap value of £0.20 per kg on all losses. On Process B there is a normal loss of 5% but lost material has no scrap value.

For the recent processing the transfer of finished product from Process A was 1,300kg and the transfer from Process B to finished stock was 1,600kg.

• **Requirement for question 5**

- (a) Prepare the Process A and Process B accounts for the recent costing period. 10
- (b) Prepare the Normal loss and Abnormal loss accounts together with the Scrap sales account. 6
- (c) State briefly an alternative treatment for scrap, other than crediting to the appropriate process account. 3
- (d) Last year a temporary accounts assistant was employed at G.Wazoo and some statistical analysis carried out. It was reported that *average* monthly output from Process B, over a period of 5 years, was 1,650kg. Unfortunately, it is not known what measure of average the assistant used. Define the terms *mean*, *median* and *mode* and state briefly an advantage for each of these measures of average. 6

(25)