COST ACCOUNTING AND QUANTITATIVE ANALYSIS

Foundation stage examination
5 December 2001

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.

CIPFA

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Birch Plc is a manufacturing company which has the following budgeted overhead costs for two production departments (Machining department and Assembly department), and two service departments (Maintenance and Stores). Birch Plc manufactures a range of outdoor furniture. The budgeted indirect costs for the next financial year are:

	£	£
Indirect materials		
Machining department	100,000	
Assembly department	100,000	
Maintenance	45,000	
Stores	9,000	254,000
Indirect wages		
Machining department	100,000	
Assembly department	98,500	
Maintenance	92,500	
Stores	46,000	337,000
Managers' salaries		80,000
Depreciation of machinery		150,000
Heating and lighting		50,000
Building insurance		25,000
Insurance of machinery		15,000
Rent and rates		100,000
		1,011,000

The following additional information is available:

	Number of employees	Floor area	Value of machines	Materials issued from Stores	Machine hours	Direct labour hours	Maintenance hours
		(sq. m)	£	£			
Machine dept	15	5,000	200,000	40,000	50,000	50,000	500
Assembly dept	15	7,500	50,000	40,000	25,000	75,000	250
Maintenance	5	5,000		20,000			
Stores	5	7,500					250

Order AXB 03 has just been received and a price needs to be established for it. The order will be produced in the next financial year and it will require 25 direct labour hours and 20 machine hours. The labour cost is expected to be £8 per hour (with reasonable certainty), but the price of direct materials is fluctuating widely. The following direct materials costs for this order have been estimated:

Direct materials cost	Probability of this being the cost
£900	20%
£1,200	50%
£1,600	30%

Birch Plc sets prices based on the *full* standard cost of a product plus a 25% mark-up.

- **Requirement for question 1**

(a)   Allocate the budgeted indirect costs to each department and adopt the specific order of closure method to apportion the service departments.   *10*

(b)   Calculate separate overhead absorption rates for each production department.   *3*

(c)   Explain why it would be more usual for Birch Plc to calculate overhead recovery rates using standard costs and activity rather than wait for actuals at the end of the year. Describe any problems this may cause.   *5*

(d)   Calculate the 'expected' cost of materials for order AXB 03, and use this to establish the price which should be charged for the order.   *7*

(25)

2 Larch Papers Plc produces paper from woodpulp and other materials with the production process involving two stages. In Process A two materials are mixed (Woodpulp and Viscose) and two grades of labour used (Stirrers and Checkers). Output from Process A is transferred to Process B where a further material is added (Finishing agent) and a single grade of labour employed (Finishing staff). Output from Process B is transferred to finished goods stock. Both processes also incur overhead costs and a normal loss on Process A of 10% of input is expected with a normal loss on Process B of 20%.

The company uses a process costing system and the following information has been extracted from the cost records for the costing period just ended:

Process A

Woodpulp used	2,500 kg at a cost of £9 per kg
Viscose used	1,000 kg at a cost of £2.50 per kg
Stirrers	400 hours at a wage rate of £15 per hour
Checkers	200 hours at a wage rate of £25 per hour

Overheads are charged to Process A as a percentage oncost – 32% of total material costs for the process, *plus* a flat rate amount of £3,600.

Process B

Finishing agent used   200 kg at a cost of £50 per kg

Finishing staff   200 hours at a wage rate of £20 per hour

Overheads are charged to Process B as a percentage oncost – 50% of total Finishing material costs for the process, *plus* a flat rate amount of £1,280.

All scrap from Process A is sold for £1 per kg and all scrap from Process B is sold for £2 per kg.

Output from Process A was 3,000 kg and from Process B was 2,700 kg.

Further information:

Records have been kept showing output from the two processes over previous costing periods. Output from Process B is normally expected to be 2,500 kg each period. Actual output for the previous six periods has been:

2,460 kg   2,600 kg   2,650 kg   2,520 kg   2,790 kg   2,620 kg

The Managing Director of Larch Papers (J C Black) has said . . . "I am not a financial or statistical expert, but it seems to me that our assumptions might not be correct. The previous five periods data seems to be significantly higher than we would expect. I would like to know whether we should change our expectation that output should normally be 2,500 kg".

- **Requirement for question 2**

(a)   Prepare cost accounts for each of the two processes.   *11*

(b)   Prepare the Normal Loss Account and the Abnormal Gain/Loss Accounts.   *6*

(c)   Test the hypothesis, at the 95% significance level, that the normal output from Process B should be expected to be 2,500 kg. Comment on the statement made by J C Black.   *8*

(25)

3

• **Requirement for question 3**

(a) Identify and explain the different types of standard costs which may be used in a standard costing system and discuss whether standard costing is able to be used in the public sector.   *8*

(b) Willow Parts manufacture a specialist wooden component called the Grommit used in ocean going yachts. They use a standard costing system to help control costs. The costing system shows the following results for last month:

No. of Grommits produced:	1,200
Wood used:	1,500 kg at a cost of £3,300
Labour used: Turners	2,500 hrs at £9.50 per hr
Finishers	1,200 hrs at £8.20 per hr

The standard cost card for a Grommit is as follows:

Materials (Wood)	1kg @ £2 per kg =	£2
Labour (Turners)	2 hrs @ £10 per hr =	£20
(Finishers)	1 hr @ £8 per hr =	£8
Standard cost		£30

You are required to calculate the following variances for last month:

Materials Cost, Price, Usage; and
Labour Cost, Rate, Efficiency
(for both Turners and Finishers)   *9*

(c) The number of Grommits produced each month has been found to be normally distributed. Analysis of output shows that the mean number produced is 1,356 with a standard deviation of 400.

(i)   Describe the characteristics of a normal distribution.   *4*

(ii) Calculate the probability that production will exceed 1,500 Grommits in a month.   *4*

(25)

4

Sitka Outdoor pursuit centre provides a range of management development activities. The work of the centre varies seasonally and the following numbers of sessions have been recently provided:

	1999	2000	2001
Quarter 1	500	505	511
Quarter 2	450	452	459
Quarter 3	517	523	527
Quarter 4	555	560	N/A

The information for quarter 4 in 2001 is not yet available.

The Director of Activities is keen to predict the cost of running the centre next year and has asked the Management Accountant to provide cost information based on optimistic and pessimistic scenarios. The following information has been provided showing projected annual costs for 2002 at two different activity levels:

	Annual Sessions	
	1,800	2,200
Direct labour	£272,000	£297,000
Direct materials	£36,000	£44,000
Other direct expenditure	£17,700	£20,600
Heat, light and power	£5,600	£6,400
Overheads	£120,000	£120,000

Direct labour costs are fixed up to 2,000 sessions per year, but a new member of staff will need to be taken on if more than 2,000 sessions are to be provided. This is the only semi-fixed cost in the table above.

The Director of Activities has predicted the total number of sessions for next year to be 1,996. This estimate was based on an average of the 2001 session data as follows:

2001 Sessions	Quarter 1	511
	Quarter 2	459
	Quarter 3	527
	Total	1,497 ÷ 3 x 4 = 1,996 sessions predicted for 2002

- **Requirement for question 4**

(a)   Calculate the cost of running the centre in 2002, based on the predicted total sessions of 1,996.   *6*

(b)   Using 'Time Series Analysis – Decomposition Multiplicative Model', forecast quarterly production for the four quarters of 2002, based on the three years' activity data.   *14*

(c)   Explain why the estimate of costs based on the time series analysis is better than the estimate based on the Director of Activities' figures.   *5*

(25)

5

Poplar Products manufacture a product which requires specialist materials imported from the United States of America. The price paid for the material varies considerably on a weekly basis and the company's stock records show the following for the three months just ended:

Date	Quantity bought (kg)	Total price paid £
2 September 2001	1,000	16,000
8 September 2001	2,000	34,000
21 September 2001	2,500	37,500
2 October 2001	1,500	27,000
26 October 2001	2,000	40,000
5 November 2001	1,000	22,000
17 November 2001	1,500	36,000

Amounts of material which were issued and used by the production section during this period were as follows:

Issued:

Date	Quantity (kg)
10 September 2001	500
20 September 2001	700
19 October 2001	2,500
12 November 2001	2,900

(NB. There were no opening stocks of material at the start of the three month period)

- **Requirement for question 5**

(a)   Calculate the cost of materials issued to production and the value of materials in stock at the end of November by writing up the stock ledger using:

    (i)   a first-in, first-out (FIFO) approach
    (ii)   a cumulative weighted average approach   *10*

(b)   Explain what is meant by a *periodic* weighted average pricing method, how it differs from (a) (ii) above, and any drawbacks associated with using this method.   *4*

(c)   The managing director has noticed on two American web sites forecasts of price rises for this material. One site said that "overall the price of this material is expected to rise by an average of 2% per month for the next 12 months." The second site expected that "generally this material will rise in price by 3% per quarter over the next year". Using the latest price paid as a base, calculate the price Poplar might be expecting to pay at the end of 12 months, if these two forecasts are correct, and state the percentage increase these prices would represent over the price paid on 17 November 2001.   *5*

(d)   Explain how in times of rising prices the last-in, first out (LIFO) method of pricing stock issues would produce a lower valuation of closing stock than the FIFO approach.   *6*

(25)