Business Accounting

Jill Collis and Roger Hussey (2007)

Student Workbook

Bring this **lecture workbook**, a **calculator** and a **pencil** to the lectures.

Use pencil for the exercises, confirming the answer in pen as we go through the solutions.

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Contents

Part I The world of accounting and finance

1 Nature and purpose of accounting

Exercise 1 Let's talk about accounting

Jot down one or two thoughts in answer to the following questions:

a) What is accounting?

……

……

……

b) Why do you need to learn about the world of accounting?

……

……

……

At home, read through your lecture notes and study Chapter 1.

2 Accounting principles and rules

Exercise 1 What makes financial useful?

How useful are your bank statements?

	Yes/No
1. Is any item insignificant or irrelevant?	☐
2. Does the information help you make spending or borrowing decisions?	☐
3. Is the information an accurate record of your cash transactions?	☐
4. Can you compare it with previous periods?	☐
5. Can you understand the information?	☐

At home, read through your lecture notes and study Chapter 2.

3 The importance of cash

Exercise 1 Your business

Information about cash is very important. Imagine you have £200 that you use to buy a computer from another student. You're a bit of an optimist and decide to advertise it in the newspaper, which costs £10. By the end of the month you've sold the computer for £300 cash and have no other business transactions.

Required
What is your cash position of your business at the end of the month?

……

Exercise 2 Revised cash flow forecast

Ros sees that the cumulative cash position by the end of October will be a cash deficit of £410 (we use brackets to indicate a negative figure). She concludes that she will have to put more capital into Cotswold Coolers and proposes to invest £20,000.

Required
Complete the revised cash flow forecast for the first four months by calculating the net cash flows and the cumulative cash position at the end of the period.

Cotswold Coolers
Revised cash flow forecast July – October

	July	Aug	Sept	Oct	Total
	£	£	£	£	£
Cash inflows					
Capital	20,000	0	0	0	20,000
Sales	700	1,000	1,500	2,000	5,200
Interest	0	0	0	0	0
Total inflows	20,700	1,000	1,500	2,000	25,200
Cash outflows					
Purchases	8,900	1,000	1,000	1,000	11,900
Delivery van	5,000	0	0	0	5,000
Rent and rates	600	0	0	600	1,200
Electricity	375	0	0	375	750
Drawings	0	0	700	700	1,400
General expenses	150	150	30	30	360
Total outflows	15,025	1,150	1,730	2,705	20,610
Net cash flow (in – out)	5,675	(150)	?	?	?
Cumulative b/f	0	?	?	?	?
Cumulative c/f	5,675	?	?	?	?

At home, read through your lecture notes and study Chapter 3.

Part II Financial accounting

4 & 5 The accounting system and the trial balance

Exercise 1 Starting a business

Supposing you start a business selling second-hand textbooks on 1 January with capital of £200 in cash savings and have no other transactions.

Required
Show the financial position of your business at the end of that day in terms of the accounting equation.

Capital			=	Assets			-	Liabilities		
From owner	£	?			£	?			£	?

Exercise 2 Purchasing stock

The business has capital of £200 in the form of cash. On 2 January the business purchases £200 stock on credit Mr Big Supplier.

Required
Show the effect of these transactions on the accounting equation.

Capital		=	Assets		-	Liabilities	
	£			£			£
From owner	?		Stock	?		Creditors	?
			Cash	?			
Total	?			?			?

Exercise 3 Balancing the accounts

Required
Balance the cash account and the sales account.

Cash account

		£			£
1 Jan	Capital	200			
2 Jan	Cash	300			
		?	31 Jan	Closing balance	?
1 Feb	Opening balance	?			

Sales account

		£			£
31 Jan	Closing balance	?	2 Jan	Cash	300
			1 Feb	Opening balance	?

At home, read through your lecture notes and study Chapters 4 & 5.

6 Measuring financial performance

Exercise 1 Comparing cash and profit

You'll remember this example from last time. You have £200 that you use to buy a computer from another student. You decide to advertise it in the newspaper, which costs £10, and you sell it for £300 cash by the end of the month. You have no other business transactions.

Required

a) What is the cash position of your business at the end of the month?

……

b) What is your profit for the month?

……

Exercise 2 Difference between cash and profit

The same example: You have £200 that you use to buy a computer. You advertise it in the newspaper, which costs £10 cash. You sell it for £300 as before, but this time the buyer can't pay you straight away, so you give him one month's credit.

Required

a) What is the cash position of your business at the end of the month?

……

b) What is your profit for the month now?

……

Exercise 3 Using accounting principles

Jot down at least two accounting principles you used in Exercise 2 when calculating the profit your business has made.

……

……

Exercise 4 Profit and loss account

Imagine that Cotswold Coolers was successfully launched on 1 July 2005. It's now the end of the first year and Ros wants to know how profitable the business is, so she asks the bookkeeper to produce a trial balance.

Required
Using the appropriate figures from the trial balance, complete the profit and loss account for the year ending 30 June 2006. The nearest column is used for preliminary calculations and subtotals are placed in the next column on the right where further calculation take place.

Cotswold Coolers
Trial balance at 30 June 2006

	£	£	*Additional information*	£
Sales		38,500	Stock at 30 June 2006	10,000
Purchases	29,000			
Vehicles (at cost)	5,000			
Trade debtors	6,800			
Trade creditors		9,100		
Bank	15,100			
Cash	350			
Rent and rates	2,400			
Electricity	1,500			
Drawings	7,000			
General expenses	600			
Interest receivable		150		
Capital at start of year		20,000		
	67,750	67,750	Tip: Tick each item as you use it	

Cotswold Coolers
Profit and loss account for the year ending 30 June 2006

		£	£
	Sales		?
Less	Cost of sales		
	Purchases	?	
	Less Closing stock	( )?	( )?
	Gross profit (Sales – CoS)		?
	Interest receivable		?
			?
Less	Expenses		
	Rent and rates	?	
	Electricity	?	
	General expenses	?	( )?
	Net profit (GP – Expenses)		?

At home, read through your lecture notes and study Chapter 6.

7 Measuring financial position

Exercise 1 Classifying assets and liabilities

Classify the following into fixed assets, current assets, creditors due within one year (ie current liabilities) or creditors due after more than one year (ie long-term liabilities).

		Fixed Assets	Current assets	Creditors ≤ 1 year	Creditors > 1 year
Vehicles	£5,000				
Trade debtors	£6,800				
Trade creditors	£9,100				
Bank	£15,100				
Cash	£200				
Stock	£10,000				

Exercise 2 Balance sheet

Required

Using the appropriate figures from the trial balance, complete the balance sheet as at 30 June 2006. Remember to tick each figure as you use it. You will now use the figures that you did not use when preparing the profit and loss account (these have already been ticked). When you have finished, you will have ticked all the items in the trial balance one and the additional information twice.

Cotswold Coolers
Trial balance at 30 June 2006

	£	£
Sales		38,500 ✓
Purchases	29,000 ✓	
Vehicles (at cost)	5,000	
Trade debtors	6,800	
Trade creditors		9,100
Bank	15,100	
Cash	350	
Rent and rates	2,400 ✓	
Electricity	1,500 ✓	
Drawings	7,000	
General expenses	600 ✓	
Interest receivable		150 ✓
Capital at start of year		20,000
	67,750	67,750

Additional information	£
Stock at 30 June 2006	10,000 ✓

Cotswold Coolers
Balance sheet as at 30 June 2006

		£	£
	Fixed assets		
	Vehicles (at cost)		?
	Current assets		
	Stock	?	
	Trade debtors	?	
	Bank	?	
	Cash	?	
		?	
Less	Creditors: amounts due within one year		
	Trade creditors	( )?	
	Net current assets (CA – Creditors ≤ 1 year)		?
	Total net assets (FA + NCA)		?
	Capital and reserves		
	Capital at start of year	?	
Add	Net profit for the year	15,150	
		?	?
Less	Drawings	( )?	?

At home, read through your lecture notes and study Chapter 7.

8a Financial statements of a sole trader – stock, accruals and prepayments

Exercise 1 Accounting principles revisited

Post trial balance adjustments are guided by UK GAAP and in particular by the following accounting principles:

- Historical cost concept
- Accruals concept
- Prudence concept
- Consistency concept

Required
Jot down a brief explanation of the principles given by each of these concepts.

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Exercise 2 Estimating accrued expenses

Cotswold Coolers has paid several invoices for electricity used during the year, which total £1,500 for the 10 months to 30 April 2006. The bill that covers the last 2 months of the accounting period has not yet been received.

Required
How much would it be fair to charge for the expense of electricity for the year ending 30 June 2006?

……

Exercise 3 Calculating prepaid expenses

Cotswold Coolers has paid £2,400 in rent and rates during the year ending 30 June 2006, but 10% of this relates to next year.

Required
How much should be charged for the expense of rent and rates for the year ending 30 June 2006?

……..

Exercise 4 Adjustments for stock, accruals and prepayments

Using the trial balance and the additional information provided, complete the profit and loss account and balance sheet, making the necessary adjustments for stock, accruals and prepayments.

Cotswold Coolers
Trial balance at 30 June 2006

	£	£
Sales		38,500
Purchases	29,000	
Vehicles (at cost)	5,000	
Trade debtors	6,800	
Trade creditors		9,100
Bank	15,100	
Cash	350	
Rent and rates	2,400	
Electricity	1,500	
Drawings	7,000	
General expenses	600	
Interest receivable		150
Capital at start of year		20,000
	67,750	67,750

Additional information	£
Stock at 30 June 2006	10,000
Accruals	
Electricity	300
General expenses	50
Prepayments	
Rent and rates	240

Tip: Tick off each item as you use it. Once you have finished, you will have ticked all the items in the trial balance once and all the additional items of information twice.

Cotswold Coolers
Profit and loss account for the year ending 30 June 2006

		£	£
	Sales		38,500
Less	Cost of sales		
	Purchases	29,000	
	Less Closing stock	( )?	( )?
	Gross profit (Sales – CoS)		?
	Interest receivable		150
			?
Less	Expenses		
	Rent and rates	?	
	Electricity	?	
	General expenses	?	( )?
	Net profit (GP – Expenses)		?

Cotswold Coolers
Balance sheet as at 30 June 2006

		£	£
	Fixed assets		
	Vehicles (at cost)		5,000
	Current assets		
	Stock	?	
	Trade debtors	6,800	
	Bank	15,100	
	Cash	350	
		?	
Less	Creditors: amounts due within one year		
	Trade creditors	9,100	
	Accruals	?	
		( )?	
	Net current assets (CA – Creditors ≤ 1 year)		?
	Total net assets (FA + NCA)		?
	Capital and reserves		
	Capital at start of year	20,000	
Add	Net profit for the year	?	
		?	
Less	Drawings	(7,000)	?

At home, read through your lecture notes and study Chapter 8 (sections 8.1-8.4).

8b Financial statements of a sole trader – depreciation of fixed assets

Exercise 1 Calculating the provision for depreciation

In its first year of trading, a business buys office equipment for £10,000, which it is estimated will have a useful economic life of 4 years and a residual value of £2,000 at the end of that time

Required
How much would it be fair to charge as the provision for depreciation on equipment in year 1?

a) £10,000
b) £8,000
c) £2,500
d) £2,000

Exercise 2 Straight-line method of depreciation

On 1 July 2005 Cotswold Coolers bought a second-hand delivery van for £5,000
Ros estimates that the van will have no residual value at the end of its useful economic life of four years

Required
Calculate the provision for depreciation on this vehicle, using the following formula:

$$\frac{\text{Cost} - \text{Residual value}}{\text{Useful economic life}}$$

……

Exercise 3 Reducing balance method of depreciation

The same information: Cotswold Coolers bought a second-hand delivery van for £5,000 which is expected to have no residual value. This time, depreciate the van using a rate of 40% and the reducing balance method.

Required
Complete the pro forma by calculating the provision for depreciation using the reducing balance formula for Year 2 onwards (NBV × Depreciation rate).

Year			£
0	Cost of van at start of Year 1		5,000
1	Depreciation	(5,000 - 0 × 40%)	(2,000)
	NBV		3,000
2	Depreciation	(NBV × 40%)	( )?
	NBV		?
3	Depreciation	(NBV × 40%)	( )?
	NBV		?
4	Depreciation	(NBV × 40%)	( )?
	NBV		?

At home, read through your lecture notes and study Chapter 8 (section 8.5).

8c Financial statements of a sole trader – bad debts and doubtful debts

Exercise 1 Estimating doubtful debts

At the end of the first year Cotswold Coolers has trade debtors of £6,800 and Ros estimates that 10% of these debts owed by customers will not be paid.

Required
Calculate the provision for doubtful debts for year 1 based on 10% of trade debtors.

……

Exercise 2 Using and ageing schedule

With experience, Ros may find that the older the debt, the less likely it is to be paid. So, an alternative method is to apply percentages that increase with the age of the debt.

Required
Using the pro forma, recalculate the provision for doubtful debts for year 1 using the ageing schedule and compare with your answer to Exercise 1.

Age (months)	Trade debtors	Estimated bad	Provision for doubtful debts
	£	%	£
1 – 3	4,400	1	?
4 – 6	1,900	20	?
Over 6	500	75	?
Total	6,800	Total	?

At home, read through your lecture notes and study Chapter 8 (section 8.6-8.8).

9 Financial statements of a partnership

Exercise 1 Profit and loss appropriation account

Complete the profit and loss appropriation account for Hearth & Home from the trial balance and additional information available at 31 December 2005.

Hearth & Home
Trial balance at 31 December 2005

		£000	£000
Sales			532
Purchases		245	
Premises		300	
Fixtures and fittings		60	
Trade debtors		198	
Trade creditors			37
Bank			93
Stock at start of year		96	
Wages		67	
Administration expenses		43	
Provision for doubtful debts			1
Capital accounts	Rob		270
	John		130
Current accounts	Rob		7
	John		6
Drawings	Rob	40	
	John	27	
		1,076	1,076

Additional information		£000
Stock at 31 December 2005		148
Provision for doubtful debts		2
Interest on drawings	Rob	4
Salaries	Rob	44
	John	40
Interest on capital		10%
Profit sharing		50%

Hearth & Home
Profit and loss appropriation account

		£000	£000	£000
Net profit available for appropriation				228
Interest on drawings	Rob			4
				232
Less Interest on capital (10%)	Rob	?		
	John	?	?	
Salaries	Rob	44		
	John	40	?	( )?
Balance of profits to be shared				?
	Rob	50%	?	
	John	50%	?	

Exercise 2 Balance sheet

The firs half of a partnership balance sheet is similar to that of a sole trader, but the second half shows the closing balances on the partners' capital and current accounts:

		£000
Capital accounts	Rob	270
	John	130
Current accounts	Rob	88
	John	86

Required
Use this information to complete the balance sheet for Hearth & Home.

Hearth & Home
Balance sheet as at 31 December 2005

		£000	£000	£000
Fixed assets				
Premises			300	
Fixtures and fittings			60	360
Current assets				
Stock			148	
Trade debtors		198		
Provision for doubtful debts		(2)	196	
			344	
Creditors: amounts due within 1 year				
Trade creditors		37		
Bank overdraft		93	(130)	
Net current assets				214
Total net assets				574
Capital accounts	Rob		?	
	John		?	?
Current accounts	Rob		?	
	John		?	?
				?

At home, read through your lecture notes and study Chapter 9.

10 Financial statements of a limited company

Exercise 1 Share capital

Note 21 to the 2006 accounts of Ted Baker Plc tells us that the company has authorized share capital of 80,000,000 ordinary shares of 5p each. At 28 January 2006, 42,989,801 shares had been issued, called up and paid for in full.

Required
Calculate the called-up share capital fully paid.

……..……

Exercise 2 Basic earnings per share

Note 9 to the 2006 accounts of Ted Baker Plc tells us that the profit for the period attributable to the ordinary shareholders for the year ended 28 January 2006 was £12,919,000 and the company had issued an average of 42,236,880 ordinary shares.

Required
Calculate the basic EPS in pence using the following formula:

Profit attributable to ordinary shareholders
Average number of ordinary shares issued

……..……

At home, read through your lecture notes and study Chapter 10.

11a Analysing financial statements – profitability and liquidity ratios

Exercise 1 Return on capital employed

Return on capital employed (ROCE) measures the percentage return on the investment of funds in the business. It provides information on how effective the business is in generating revenue from resources and management's ability to control costs.

Required
Calculate ROCE for Ted Baker Plc using the formula:

$$\frac{\text{Profit before interest and tax}}{\text{Capital employed (ie Non-CA + CA – CL)}} \times 100$$

……

Exercise 2 Capital turnover

Capital turnover measures the number of times capital employed has been used during the year to achieve the sales revenue.

Required
Calculate the capital turnover for Ted Baker Plc using the formula:

$$\frac{\text{Turnover (ie Revenue)}}{\text{Capital employed}}$$

……

Exercise 3 Acid test

The acid test is a liquidity ratio that shows the relationship between liquid assets and current liabilities, and is usually expressed as x:1. Liquid assets are all current assets except stock (inventories), which take longer to convert into cash.

Required
Calculate the acid test for Ted Baker Plc using the following formula:

$$\frac{\text{Current assets – Stock}}{\text{Current liabilities}}$$

……

Exercise 4 Debtor collection period

The debtor collection period is an efficiency ratio that measures the average time trade debtors have taken to pay the business for goods and services over the year. Note 16 in Ted Baker's 2006 accounts tells us that trade debtors (ie Trade receivables) were £7,943k.

Required
Calculate the debtor collection period for Ted Baker Plc, using the formula:

$$\frac{\text{Trade debtors (ie Trade receivables)}}{\text{Turnover (ie Revenue)}} \times 365 \text{ days}$$

……

At home, read through your lecture notes and study Chapter 11 (sections 11.1-11.4).

11b Analysing financial statements – gearing and investment ratios

Exercise 1 Interest cover

Interest cover assesses the relative safety of interest payments by measuring the number of times interest payable on long-term debt is covered by the available profits. This overcomes the problem of different definitions for debt and equity. Note 4 in Ted Baker's 2006 accounts tells us that interest payable was £109k.

Required
Calculate the interest cover for Ted Baker Plc using the formula:

$$\frac{\text{Profit before interest and tax}}{\text{Interest payable}}$$

……

Exercise 2 Significance of gearing on profitability

Return on capital (ROCE) employed does not take account of gearing because our definition of capital employed only excludes current liabilities and not any long-term debts:

$$\frac{\text{Profit } \textit{before} \text{ interest and tax}}{\text{Capital employed}} \times 100$$

(ie total assets – *current* liabilities)

But return on equity (ROE) does consider gearing:

$$\frac{\text{Profit } \textit{after} \text{ tax}}{\text{Capital + Reserves}} \times 100$$

(and after interest on debt finance)
(same as total assets – *total* liabilities)

Required
Calculate these two ratios for Ted Baker Plc.

a) ROCE ……

b) ROE……

Exercise 3 Dividend net

Dividend net calculates the dividend per share paid in the financial year. Note 8 in Ted Baker's 2006 accounts tells us that interim dividends paid were £1,637k and final dividends were £3,442k.

Required
Calculate the dividend net for Ted Baker Plc using the following formula:

$$\frac{\text{Total dividends}}{\text{No. of ordinary shares}}$$ (Answer is in pence)

……..

Exercise 4 Yield gross

Yield gross builds on the dividend net and measures the dividend yielded on a share in relation to the market price of the share on the last day of the period for which the accounts were prepared.

Required
If Ted Baker's share price on the last day of the accounting period was 514p, calculate the yield gross for Ted Baker Plc using the formula:

$$\frac{\text{Dividend net}}{\text{Share price}} \times 100$$

……..

Exercise 5 Earnings per share and price/earnings ratio

Earnings per share (EPS) is based on the total return, including retained profit (see Chapter 10). Ted Baker's basic EPS = 30.6p. The price/earnings (P/E) ratio reflects the stock market's confidence in how long the current level of EPS will be sustained (in years) by comparing the amount invested in a share (the share price) with the EPS.

Required
Using Ted Baker's basic EPS and share price of 514p, calculate the P/E ratio using the formula:

$$\frac{\text{Share price}}{\text{Earnings per share}}$$ (answer is in years)

……

At home, read through your lecture notes and study Chapter 11 (sections 11.5-11.8).

Part III Management accounting

12 Importance of cost information

Exercise 1 Direct and indirect costs

Ros expects the production costs will be as follows:

- Mineral water (in bulk)
- Bottles, lids and labels
- Rent and rates
- Electricity (lighting, heating and power)
- Wages (for the bottling operative)
- Depreciation on the bottling machine

Required
Indicate whether the above costs are direct costs or indirect costs

Exercise 2 Total cost statement

Cotswold Coolers will produce 1,000 units per week. The direct and indirect costs for 1,000 units will be:

- Mineral water £300; bottles, lids and labels £750
- Production overheads £850; administration overheads £350; selling and distribution overheads £750

In a simple business like this, the overheads can be apportioned by dividing them by the number of units produced

Required
Using the pro forma, calculate the total cost of 1 unit

Cotswold Coolers
Total cost statement (1 unit)

		£	£
	Direct materials		
	Mineral water	?	
	Bottle, lid and label	?	
	Prime cost		?
Add	Production overheads		?
	Production cost		?
Add	Indirect costs		
	Administration overheads	?	
	Selling and distribution overheads	?	?
	Total cost		?

Exercise 3 Establishing the selling price

Now all Ros needs to do is to add an appropriate mark up to represent profit and she will know what she needs to charge for each cost unit. She has decided that the *gross profit mark up* will be 50% of the production cost.

Required
Add 50% of the production cost to the total cost you calculated in the previous exercise to find the selling price of 1 cost unit.

At home, read through your lecture notes and study Chapter 12.

13 Costing for product direct costs

Exercise 1 Costing direct materials

On 1 January Cotswold Coolers took delivery of 100 plastic bottles, which were bought for 20p each. On 5 January another 200 bottles were received, but the price had gone up to 22p each. On 7 January 50 bottles were issued to production.

Required

a) How much should be charged for the 50 bottles issued to production on 7 January?

……

……

b) What is the quantity and value of the closing stock on 7 January?

……

……

Exercise 2 First in, first out method

Receipts of materials into stores

- 1 January 100 bottles, bought for 20p each
- 5 January 200 bottles, bought for 22p each

Issues from stores to production

- 7 January 50 bottles
- 14 January 150 bottles

Required

Complete the stock account using the price of the earliest consignment received for all issues to production until the quantity received at that price has been issued; then use the price of the next consignment.

Stock account

FIFO	Receipts			Issues			Stock balance	
Jan	Quantity	Price £	Value £	Quantity	Price £	Value £	Quantity	Value £
1	100	0.20	20.00				100	20.00
5	200	0.22	44.00				300	64.00
7				50	0.20	?	250	?
14				50	0.20	?	200	?
14				100	0.22	?	100	?
					Total	?		

Exercise 3 Continuous weighted average method

An alternative is to use the continuous weighted average (CWA) method. This is based on the weighted average price, which is recalculated every time a consignment is received. The formula for the weighted average price is:

$$\frac{\text{Total stock value}}{\text{Total quantity of stock}}$$

Required
Complete the pro forma stock account using the continuous weighted-average price.

Stock account

CWA	Receipts			Issues			Stock balance	
Jan	Quantity	Price £	Value £	Quantity	Price £	Value £	Quantity	Value £
1	100	0.20	20.00				100	20.00
5	200	0.22	44.00				300	64.00
7				50	?	?	250	?
14				150	?	?	100	?
					Total	?		

At home, read through your lecture notes and study Chapter 13.

14a Costing for indirect costs – allocating and apportioning overheads

Exercise 1 Apportioning indirect labour

The cost of indirect labour for the period is £45,000 and the total number of employees is 3.

Required
Apportion the indirect labour between the cost centres on the basis of the number of employees.

Bottling (2 employees)	Warehouse (1 employee)
Share of indirect labour cost: ……?	Share of indirect labour cost: ……...?

Exercise 2 Overhead analysis

Complete the overhead analysis using appropriate information from the following table as the basis for apportioning the production overheads between the two cost centres.

Cost centre data	*Total*	*Bottling*	*Warehouse*
No. of employees	3	2	1
Production area (sq metres)	600	200	400
Value of machinery (£)	80,000	60,000	20,000
Value of stock (£)	5,000	1,000	4,000

Cotswold Coolers
Overhead analysis

Overhead	**Total**	**Basis of apportionment**	**Bottling**	**Warehouse**
	£		£	£
Indirect materials	1,500	Allocated	900	600
Indirect labour	45,000	No. of employees	30,000	15,000
Rent and rates	27,000	Area		
Electricity	6,000	Area		
Depreciation on machinery	8,000	Value of machinery		
Supervision	21,000	No. of employees		
Stock insurance	500	Value of stock		
Total	109,000			

At home, read through your lecture notes and study Chapter 14 (sections 14.1-14.3).

14b Costing for indirect costs – absorbing overheads

Exercise 1 Cost unit OAR

The *cost unit* OAR is the simplest to use and the formula is:

$$\frac{\text{Cost centre overheads}}{\text{Number of cost units passing through}}$$

104,000 units were produced during the period.

- Production overheads were £64,000 for the bottling department and £45,000 for the warehouse.

Required
Using the formula, calculate the cost unit OAR for each cost centre.

……

Exercise 2 Machine hour OAR

An alternative is the *machine hour* OAR:

$$\frac{\text{Cost centre overhead costs}}{\text{Total machine hours}}$$

104,000 units were produced during the period.

- Production overheads were £64,000 for the bottling department and £45,000 for the warehouse.
- Total machine hours were 16,000 for the bottling department and 2,000 for the warehouse.

Required
Using the formula, calculate the machine hour OAR for each cost centre.

……

Exercise 3 Production cost per unit

Direct costs per unit are mineral water £0.30; bottle, lid and label £0.75.
The OAR in the bottling department will be £4.00 per machine hour (from Exercise 2).
The OAR in the warehouse will be £0.43 per unit (from Exercise 1).

Required
Complete the production cost statement and calculate the production cost per unit.

Cotswold Coolers
Production cost statement (1 unit)

	£	£
Direct costs		
Mineral water	0.30	
Bottle, lid and label	0.75	
Prime cost		?
Production overheads		
Bottling dept	?	
Warehouse	?	?
Production cost		?

Exercise 4 Apportioning non-production overheads

The final step is to apportion the non-production overheads (eg administration, selling and distribution, research and development costs). A simple method is to add a percentage based on the following formula:

$$\frac{\text{Non-production overheads}}{\text{Production cost}} \times 100$$

Required
Using the formula, calculate the percentage if non-production overheads are £43,250 and the production cost is £216,320.

……

At home, read through your lecture notes and study Chapter 14 (sections 14.4-14.8).

15 Costing for specific orders and continuous operations

Exercise 1 Valuing normal loss

The value of *normal loss* (the acceptable level of waste at the end of the process) is calculated as:

$$\frac{\text{Normal loss in units}}{\text{Good completed units}} \times \text{Cost per unit}$$

Cost per unit + Normal loss gives the *revised cost per unit.*

Pure Paint plc completed 800 units in Week 1. The normal loss is 50 units and the cost per unit is £12.00.

Required
Calculate the normal loss per unit and the revised cost per unit.

……..

Exercise 2 Valuing abnormal loss

The value of *abnormal loss* (waste in excess of normal loss) is calculated as:

(Actual loss in units - Normal loss in units) x Revised cost per unit

Pure Paint plc completed 800 units in Week 1. The normal loss is 50 units but the actual loss was 75 units.

Required
Calculate the value of the good completed units and the value of the abnormal loss.

……..

At home, read through your lecture notes and study Chapter 15.

16 Activity-based costing

Exercise 1 Problem with costing methods based on volume

Comfy Sofas Ltd manufactures sofas in two locations:

- The Birmingham factory manufactured 10,000 identical sofas during January
- The Manchester factory manufactured 1,000 units of each of 10 different styles of sofa during January

Required
Compare the production volumes at each factory during January and comment on the relative size of the set-up costs at the two factories.

Birmingham factory ……

Manchester factory ……

Comment on set-up costs ……

……

Exercise 2 Calculating the predetermined cost driver rate

ABC uses predetermined overheads and predetermined cost driver rates. tThe formula for calculating a cost driver rate is:

$$\frac{\text{Overhead}}{\text{Cost driver volume}}$$

Required
Using the above formula, complete the pro forma by calculating the predetermined cost driver rates for each activity.

Activity	Cost driver	Overhead	Cost driver volume	Cost driver rate
		£		
Purchasing	No. of orders placed	40,000	10,000 orders	£4.00 per order
Machine set-up	No. of machine set-ups	30,000	30 set-ups	?
Quality control	No. of inspection hours	50,000	500 hours	?
Power	No. of machine hours	25,000	10,000 hours	?
Total		145,000		

At home, read through your lecture notes and study Chapter 16.

17a Marginal costing – breakeven analysis

Exercise 1 Variable and fixed costs

Ros expects the production costs will be:

- Mineral water (in bulk)
- Bottles, lids and labels
- Rent and rates
- Electricity (lighting, heating and power)
- Wages (for the bottling operative)
- Depreciation on the bottling machine

Required
Indicate whether the above costs are variable costs or fixed costs.

Exercise 2 Marginal cost statement

A *marginal cost statement* calculates the contribution per unit, which helps determine the net profit or loss over the period. Cotswold Coolers plans to produce and sell 1,000 units of mineral water per week.

- The selling price will be £3.95 per unit
- Variable costs per unit will be mineral water £0.30; bottle, lid and label £0.75.
- Fixed costs will be £1,300 per week.

Required
Complete the marginal cost statement for 1 unit and the associated weekly profit statement based on 1,000 units.

Cotswold Coolers
Marginal cost statement

	1 unit		1,000 units	
	£	£	£	£
Sales		3.95		?
Variable costs				
Mineral water	0.30		?	
Bottle, lid and label	0.75	( )?	?	( )?
Contribution		?		?
Fixed costs				( )?
Net profit				?

Exercise 3

Ros expects the fixed costs for 1 week will be £1,300 and we know from the marginal cost statement that the contribution per unit will be £2.90.

Required
Calculate the breakeven point in units using the formula:

$$\frac{\text{Fixed costs}}{\text{Contribution per unit}}$$

……

Exercise 4 Level of activity to achieve a target profit

Ros expects the fixed costs for 1 week will be £1,300 and we know from the marginal cost statement that the contribution per unit will be £2.90. She wants to make a profit of £500

Required
Calculate the level of activity required to achieve a target profit of £500 using the formula:

$$\frac{\text{Fixed costs + Target profit}}{\text{Contribution per unit}}$$

……

At home, read through your lecture notes and study Chapter 17 (sections 17.1-17.4).

17b Marginal costing – contribution analysis

Exercise 1 Marginal cost statement revisited

Cotswold Coolers plans to produce and sell 1,000 units of mineral water per week.

- The selling price will be £3.95 per unit.
- The variable costs per unit will be mineral water £0.30; bottle, lid and label £0.75.
- The fixed costs will be £1,300 per week.

Required

Complete the marginal cost statement for 1 unit and the associated weekly profit statement based on 1,000 units.

Cotswold Coolers
Marginal cost statement

	1 unit		1,000 units	
	£	£	£	£
Sales		3.95		?
Variable costs				
Mineral water	0.30		?	
Bottle, lid and label	0.75	( )?	?	( )?
Contribution		?		?
Fixed costs				( )?
Net profit				?

Exercise 2 Ranking by contribution per unit

In addition to Plain water, Cotswold Coolers is planning to produce a Fruity product:

- The selling price of Fruity will be £4.25 per unit
- Variable costs per unit of Fruity will be mineral water £0.10; fruit juice £0.40; bottle, lid and label £0.75

Required
Complete the marginal cost statements for Plain and Fruity and rank the two products according to the contribution per unit

	Plain (1 unit)		**Fruity (1 unit)**	
	£	£	£	£
Sales		3.95		4.25
Variable costs				
Mineral water	0.30		0.10	
Fruit juice	0		0.40	
Bottle, lid and label	0.75	(1.05)	0.75	( )?
Contribution		2.90		?
Ranking		?		?

Exercise 3

Exercise 3

We now know the contribution per unit for Plain and for Fruity, but ranking products by their contribution per unit does not take account of differences in the volume of sales. Cotswold Coolers is planning to produce and sell 1,000 units of Plain and 500 units of Fruity per week.

Required
Calculate the total contribution for each product and rank them.

	Plain		**Fruity**	
Total contribution	£	?	£	?
Ranking		?		?

Exercise 4 Ranking by contribution per limiting factor

If the business anticipates a limiting factor, products can be ranked by the contribution per limiting factor. Ros wants to know which product will give the higher contribution if there is a drought during the summer that would limit the supply of mineral water.

Required
Using the following formula, calculate the contribution per limiting factor for Plain and Fruity and rank them:

$$\frac{\text{Contribution per unit}}{\text{Limiting factor per unit}}$$

	Plain	**Fruity**
Workings:	?	?
	?	?
Contribution per limiting factor	?	?
Ranking	?	?

At home, read through your lecture notes and study Chapter 17 (sections 17.5-17.8).

18 Budgetary control

Exercise 1 Role of assumptions in business planning

In order to set realistic financial plans, there needs to be a consultation process, so that management can set out their *assumptions* about what is going to happen to the firm's markets and the business environment.

Required
Using knowledge you have gained from other modules, jot down the key factors that managers should consider before setting their financial plans for a forthcoming period.

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Exercise 2 Variance analysis

Variance analysis is the investigation of the factors that have caused the differences between the actual and budgeted figures. A favourable variance is where actual performance is better than planned. An adverse variance is where actual performance is worse than planned (eg costs are higher or revenue is lower).

Required
Complete the June budget report for Jersey Flowers Ltd, indicating whether the variances are favourable or adverse.

Jersey Flowers Ltd
Budget Report for June

	Budget	Actual	Variance
	£	£	£
Sales revenue			
Roses	28,000	27,750	?
Carnations	22,000	21,500	?
Lavender	18,000	18,500	?
	68,000	67,750	?
Costs			
Salaries	20,000	20,000	?
Expenses	16,000	17,000	?
Administration	10,000	9,500	?
	46,000	46,500	?
Net profit	22,000	21,250	?

At home, read through your lecture notes and study Chapter 18.

19 Standard costing

Exercise 1 Variance analysis

Supposing the standard production for 1 hour is 100 cost units, but during an 8-hour day the actual production was 950 units.

Required
Calculate the standard production for an 8-hour day, then calculate the variance for the day, using the formula:

Standard production - Actual production

Remember to indicate whether the variance is favourable or adverse.

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Exercise 2 Direct materials – usage and price variances

Standard usage is 3 metres of direct materials for each cost unit at a standard price of £2.20 per metre. During the period, 80 cost units were made and the actual usage was 260 metres, which had an actual price of £1.95 per metre

Required

(a) Calculate the usage variance using the formula:

(Standard quantity – Actual quantity) x Standard price

……

……

(b) Calculate the price variance using the formula:

(Standard price – Actual price) x Actual quantity

……

……

Exercise 3 Direct labour – efficiency and rate variances

The time taken to produce 1 cost unit is set at 6 standard hours and standard rate of pay is £8.00 per hour. During the period, 900 cost units were made and this took 5,100 hours at an actual rate of pay of £8.30 per hour.

Required

(a) Calculate the efficiency variance using the formula:

(Standard hours – Actual hours) x Standard rate

……

……

(b) Calculate the rate variance using the formula:

(Standard rate per hour – Actual rate per hour) x Actual hours

……

……

At home, read through your lecture notes and study Chapter 19.

20 Capital investment appraisal

Exercise 1 Capital investment decisions

Cotswold Coolers is doing well and has £100,000 to invest in new bottling machines. Ros has a choice of 3 machines. Each will cost £100,000 and have an expected life of 3 years, but the net cash inflows vary:

	Machine 1	Machine 2	Machine 3
Year	£	£	£
1	60,000	20,000	10,000
2	40,000	40,000	20,000
3	20,000	60,000	95,000

Required
Complete the pro forma and decide which machine is the better investment.

		Machine 1	Machine 2	Machine 3
	Year	£	£	£
Cash outflow	0	(100,000)	(100,000)	(100,000)
Net cash inflows	1	60,000	20,000	10,000?
	2	40,000	40,000	20,000?
	3	20,000	60,000	95,000?
Subtotal		?	?	?
Net cash flow		?	?	?

Exercise 2 Mr Cornetto's ice cream van project

Mr Cornetto is considering investing in an ice cream van that will cost £12,000 and last 4 years. The estimated annual cash flows are:

	£	£
Cash inflows		
Sales		20,000
Cash outflows		
Purchases	5,000	
Wages	9,000	
Expenses	2,000	(16,000)
Net cash flow		4,000

Required
Calculate the payback period for this project using the formula:

Initial capital investment
Annual net cash flow ……(years)

Exercise 3 Mr Cornetto's pasta van project

An alternative project is to invest in a pasta van that will also cost £12,000 and last 4 years. Because take-away pasta may take some time to catch on, the annual net cash flows are expected to be £2,000 in year 1, rising to £3,000 in year 2, £5,000 in year 3 and £6,000 in year 4.

Required
Using the pro forma, calculate the payback period for the pasta van project.

Year	Net cash flow	Cumulative net cash flow
	£	£
0	(12,000)	(12,000)
1	2,000	?
2	3,000	?
3	5,000	?
4	6,000	?

……

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……

Payback period ……? (years and months)

Exercise 4 Fresh Farm Foods ARR

The owners of Fresh Farm Foods are planning to open either a farm shop or a café. Estimates for the two projects are:

	Farm shop	Café
	£	£
Average sales	62,000	109,000
Average costs and expenses	43,400	82,000
Average capital employed	100,000	180,000

Required
Using the pro forma, calculate the average profit for each project and the ARR using the following formula and decide which is the more favourable investment:

$$\frac{\text{Average profit}}{\text{Average capital employed}} \times 100$$

	Farm shop	Café
	£	£
Average sales	?	?
Average costs and expenses	( )?	( )?
Average profit	?	?
Average PBIT × 100 / Average CE	? × 100 / ?	? × 100 / ?
ARR =	? %	? %

At home, read through your lecture notes and study Chapter 20.

21 Discounted cash flow

Exercise 1 Time value of money

Imagine you have £500 now, which you can invest at 10% compound interest. Compound interest is where the interest is paid on the principal (the original sum invested) plus the interest that has accrued in previous periods (ie the interest is not withdrawn but left in the investment).

Required
Using the pro forma, calculate how much your £500 investment would be worth in two years' time.

		£
Year 0	Principal	500
Year 1	10% interest	?
	Subtotal	?
Year 2	10% interest	
	Total	

Exercise 2 NPV

Cotswold Coolers has £100,000 to invest in new bottling machines and Ros will use an interest rate of 10% as the opportunity cost of capital. She is considering 2 alternative projects. Each project has a life of 3 years and will require investment of £100,000, but the annual net cash inflows will vary:

	Project 1	**Project 2**
Year	£	£
1	60,000	30,000
2	40,000	40,000
3	20,000	60,000

Required
Using the pro forma, calculate the NPV for Project 2 (the NPV of Project 1 has already been calculated).

		Project 1		**Project 2**	
Year	Discount factor (10%)	Net cash flow £	PV £	Net cash flow £	PV £
0	1.000	(100,000)	(100,000)	(100,000)	( )?
1	0.909	60,000	54,540	30,000	?
2	0.826	40,000	33,040	40,000	?
3	0.751	20,000	15,020	60,000	?
		NPV	2,600	NPV	?

Note
Discount factor x Net cash flow = PV

Exercise 3 Discounted payback period

DCF principles can also be used to make the simple payback period technique more useful. The *discounted payback period* is 'the time required for the predicted discounted net cash flows to equal the capital invested in a proposed investment project' (Collis and Hussey, 2007, p. 357).

Required
Complete the pro forma by calculating the discounted payback period for Project 2 in years and months.

Project 2

Year	Discount factor (10%)	Net cash flow £	PV £	Cum PV £
0	1.000	(100,000)	(100,000)	(100,000)
1	0.909	30,000	27,270	(72,730)
2	0.826	40,000	33,040	(39,690)
3	0.751	60,000	45,060	5,370
		NPV	5,370	

Discounted payback period

$$= 2 \text{ years} + \frac{39{,}690}{39{,}690 + 5{,}370}.$$

= …… ? (years and months)

At home, read through your lecture notes and study Chapter 21.

Present value table for £1 at compound interest

Future years	Interest rate														
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893	0.885	0.877	0.870
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	0.812	0.797	0.783	0.769	0.756
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	0.731	0.712	0.693	0.675	0.658
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683	0.659	0.636	0.613	0.592	0.572
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	0.593	0.567	0.543	0.519	0.497
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564	0.535	0.507	0.480	0.456	0.432
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513	0.482	0.452	0.425	0.400	0.376
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	0.434	0.404	0.376	0.351	0.327
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.406	0.424	0.391	0.361	0.333	0.308	0.284
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	0.352	0.322	0.295	0.270	0.247

Future years	Interest rate														
	16%	17%	18%	19%	20%	21%	22%	23%	24%	25%	26%	28%	30%	40%	50%
1	0.862	0.855	0.847	0.840	0.833	0.826	0.820	0.813	0.806	0.800	0.794	0.781	0.769	0.714	0.667
2	0.743	0.731	0.718	0.706	0.694	0.683	0.672	0.661	0.650	0.640	0.630	0.610	0.592	0.510	0.444
3	0.641	0.624	0.609	0.593	0.579	0.565	0.551	0.537	0.524	0.512	0.500	0.477	0.455	0.364	0.296
4	0.552	0.534	0.516	0.499	0.482	0.467	0.451	0.437	0.423	0.410	0.397	0.373	0.350	0.260	0.198
5	0.476	0.456	0.437	0.419	0.402	0.386	0.370	0.355	0.341	0.328	0.315	0.291	0.269	0.186	0.132
6	0.410	0.390	0.370	0.352	0.335	0.319	0.303	0.289	0.275	0.262	0.250	0.227	0.207	0.133	0.088
7	0.354	0.333	0.314	0.296	0.279	0.263	0.249	0.235	0.222	0.210	0.198	0.178	0.159	0.095	0.059
8	0.305	0.285	0.266	0.249	0.233	0.218	0.204	0.191	0.179	0.168	0.157	0.139	0.123	0.068	0.039
9	0.263	0.243	0.225	0.209	0.194	0.180	0.167	0.155	0.144	0.134	0.125	0.108	0.094	0.048	0.026
10	0.227	0.208	0.191	0.176	0.162	0.149	0.137	0.126	0.116	0.107	0.099	0.085	0.073	0.035	0.017