Chapter 15 *Costing*

Questions

1. Vance and Vane Limited produces a range of innovative storage units, designed by some of the biggest names in contemporary furniture design. The following is a list of some of the costs incurred by the company:

   Wages of factory canteen staff

   Purchase of wood for shelving

   Salespersons' commissions earned on volume of sales achieved

   Wages of factory machine operators

   Marketing campaign expenditure

   Metal brackets for shelving units

   Depreciation of office computer

   Business rates for factory

   Quality inspector's salary

   Royalties paid to designers

   Fire insurance for factory

   Office workers' Christmas party expenses

   Classify each item of expense as one of the following:

   Direct labour

   Direct materials

   Direct expenses

   Indirect production overheads

   Other indirect overheads

2. Wellingborough Cravats Limited produces high quality silk ties. In the month ending 30 November 20X4 the company incurs the following costs:

	£
Depreciation of weaving machines	610
Secretarial and administrative salaries	3 373
Silk thread	6 866
Office supplies	861
Presentation packaging for ties	433
Factory supervisors' wages	1 604
Depreciation of office computer	82
Labels for ties	121
Other factory costs	1 080
Advertising	650
Weaving machine operators' wages	6 620
Factory cleaning	260
Repairs and maintenance of factory	676
Selling costs	1 270
Electricity (see note)	1 025
Factory rental and rates	1 665

Note: 80% of the electricity charge relates to the factory and 20% to the office.

Required: rearrange the information given into a cost statement for the month ending 30 November 20X4.

3. Zane and Aldiss Limited produces custom-built yachts for the seriously wealthy. The company uses a job costing system to accumulate costs for each yacht built. In the month of June 20X7 the company has three yachts at various stages of assembly in its dry dock. Accumulated costs to 1 June 20X7 for each yacht are as follows:

	Yacht ref: X0/22	Yacht ref: X0/24	Yacht ref: X0/27
	£	£	£
Direct material	6 625	1 030	1 850

Direct labour	2 070	663	1 200

During June 20X7 the following transfers from stores are made:

	Quantity	Value per unit	Job no
Mahogany strip	120 metres	£16 per metre	X0/22
Pine strip	80 metres	£3.50 per metre	X0/24
Metal fixing components	60 units	£0.80 per unit	X0/27
Metal fixing components	84 units	£0.75 per unit	X0/24
Metal fixing components	104 units	£1.00 per unit	X0/22

The value of other sundry materials booked to each job is as follows:

X0/22	£610
X0/24	£552
X0/27	£1 003

The input of the four different grades of direct labour is as follows:

Grade	Number of hours	Job no
4	16	X0/27
	30	X0/22
3	28	X0/24
	106	X0/27
2	88	X0/22
	78	X0/24
1	54	X0/22
	60	X0/27

The total cost to the company of the various grades of direct labour, per hour, is:

Grade 4	£12.50
Grade 3	£10.00
Grade 2	£9.50
Grade 1	£9.00

Required: design a job costing form which records the material and labour costs for each yacht up to the end of June 20X7. The form should show an accumulated prime cost total for each yacht at the end of June 20X7.

4. Amis Brevel Biscuits Limited has three principal departments in its production process: mixing, baking and packaging. In April 20X2 the company incurs the following production overheads which it plans to allocate and apportion as follows between its three departments:

	£	Basis of apportionment
Factory rental and business rates	7 910	Floor area
Factory cleaning	910	Floor area
Supervisory salaries	18 400	No. of employees
Other indirect labour	14 210	Floor area
Electricity	6 560	Actual
Building maintenance	632	Actual
Insurance	1 064	Floor area
Machinery depreciation	370	Machinery net book value
Total	50 056	

The following information is relevant for the apportionment of overheads:

	Total	Mixing	Baking	Packaging
Floor area	7 000 sq. m.	2 500 sq. m.	2 500 sq. m.	2 000 sq. m.
Employees	16	6	4	6
Machinery NBV	£44 400	£18 240	£20 040	£6 120
Electricity	£6 560	£2 160	£3 104	£1 296
Building maintenance	£632	£360	-	£272

Required: produce a schedule apportioning the overheads between the three departments (cost centres).

5. Bayleaf Manufacturing and Trading Company Limited produces several kitchen products, one of which is a bayleaf grinder. One bayleaf grinder has a prime cost of £2.20, which includes 10 minutes of direct labour (costed at £7.20 per hour). Each unit uses 15 minutes of machine time.

   The company's management accountant has estimated the following totals for the coming financial year, 20X9:

Machine hours available in the factory	20 000 hours
Direct labour hours available	40 000 hours
Total production overheads	£120 000

   What is the estimated production cost of one bayleaf grinder if

   (a) production overheads are absorbed on the basis of machine hours?

   (b) production overheads are absorbed on the basis of labour hours?

6. Combe Cullen Systems Limited manufactures two products in its Oldfield division. Traditionally the company has used an overhead absorption system based on machine hours. However, following a management consultancy exercise in which outside consultants reviewed the management information systems, the directors have decided to pilot an activity-based costing (ABC) system at the Oldfield factory. For the coming year, 20X6, Oldfield's production overheads are estimated as follows:

	£
Factory rent and rates	42 200
Heat and light to factory	23 950
Factory insurance	7 100
Supervisory salaries	38 540
Other indirect labour	18 030
Canteen charges	6 100
Machinery depreciation	18 000
Machinery maintenance	5 520
Production consumables (e.g. machine oil)	2 050
Other factory costs	7 480

Total 168 970

Following a detailed review of the production processes, the finance director and the divisional accountant identify a set of key cost drivers, together with cost allocations to each, and estimates of the relevant quantities involved for products A and B in the 20X6 financial year:

Activity	Cost driver	Total	Product A	Product B	Total cost per cost driver
£					
Planned units of production			6 000	5 000	
Machining	Machine hours	11 000	6 000	5 000	63 030
Assembly	Labour hours	9 000	3 000	6 000	43 020
Packing	Labour hours	4 000	2 000	2 000	31 000
Materials ordering	No. of orders	111	86	25	9 990
Materials issues	No. of issues	150	103	47	12 000
Machine set up	Number of hours used in set up	33	25	8	5 940
Quality inspection	Number of inspections	35	10	25	3 990
Total					168 970

Each planned unit of production of both product A and product B uses one machine hour. One unit of A has a prime cost of £12.50, while one unit of B has a prime cost of £16.00.

Required:

(a) calculate the overhead absorption rate based on the company's traditional system of using machine hours as a basis for overhead absorption

(b) calculate the overhead per unit of product A and product B using the data provided for the new ABC system

(c) calculate the production cost of one unit of product A and one unit of product B under both the old and the new costing systems

(d) comment on the difference between the production costs for each product under the old and the new costing systems

Work to two decimal places (i.e. the nearest penny).

Answers

1. Vance and Vane Limited

Wages of factory canteen staff	Indirect production overheads
Purchase of wood for shelving	Direct materials
Salespersons' commissions earned on volume of sales achieved	Other indirect overheads
Wages of factory machine operators	Direct labour
Marketing campaign expenditure	Other indirect overheads
Metal brackets for shelving units	Direct materials
Depreciation of office computer	Other indirect overheads
Business rates for factory	Indirect production overheads
Quality inspector's salary	Indirect production overheads
Royalties paid to designers	Direct expenses
Fire insurance for factory	Indirect production overheads
Office workers' Christmas party expenses	Other indirect overheads

2. Wellingborough Cravats Limited

Cost statement for November 20X4

	£	£
Direct materials		
Silk thread	6 866	
Labels for ties	121	
Presentation packaging for ties	433	
		7 420
Direct labour		
Weaving machine operators' wages		6 620
Prime cost		14 040
Production overheads		
Depreciation of weaving machines	610	
Repairs and maintenance of factory	676	
Factory rental and rates	1 665	

Electricity (80% × £1 025)	820	
Factory cleaning	260	
Factory supervisors' wages	1 604	
Other factory costs	1 080	
		6 715
Production cost		20 755
Other overheads		
Secretarial and administrative salaries	3 373	
Office supplies	861	
Selling costs	1 270	
Advertising	650	
Electricity for office	205	
Depreciation of office computer	82	
		6 441
Total costs		27 196

3. Zane and Aldiss Limited

Job costing record – June 20X7

	Job ref: X0/22 £	Job ref: X0/24 £	Job ref: X0/27 £
Direct material			
Brought forward	6 625	1 030	1 850
Mahogany 120 × £16	1 920		
Pine 80 × £3.50		280	
Metal fixings:			
60 × £0.80			48
84 × £0.75		63	
104 × £1.00	104		
Sundry materials	610	552	1 003
Materials carried forward	9 259	1 925	2 901
Direct labour			
Brought forward	2 070	663	1 200
Grade 4 16 × £12.50			200

30 × £12.50	375		
Grade 3			
28 × £10.00		280	
106 × £10.00			1 060
Grade 2			
88 × £9.50	836		
78 × £9.50		741	
Grade 1			
54 × £9.00	486		
60 × £9.00			540
Labour carried forward	3 767	1 684	3 000
Prime cost			
Materials carried forward	9 259	1 925	2 901
Labour carried forward	3 767	1 684	3 000
Prime cost carried forward	13 026	3 609	5 901

4. Amis Brevel Biscuits Limited

			Cost Centre		
	Basis	Total	Mixing	Baking	Packaging
		£	£	£	£
Factory rental/rates	Floor area	7 910	2 825	2 825	2 260
Factory cleaning	Floor area	910	325	325	260
Supervisory salaries	No. of employees	18 400	6 900	4 600	6 900
Other indirect labour	Floor area	14 210	5 075	5 075	4 060
Electricity	Actual	6 560	2 160	3 104	1 296
Building maintenance	Actual	632	360	-	272
Insurance	Floor area	1 064	380	380	304
Machinery depreciation	Machinery NBV	370	152	167	51
Totals		50 056	18 177	16 476	15 403

5. Bayleaf Manufacturing and Trading Company Limited

(a) Overheads absorbed on a machine hours basis:

The overhead absorption rate is:

$\frac{£120\,000}{}$ = £6 per machine hour

20 000

The production cost of one bayleaf grinder is:

Prime cost	2.20
Overhead (£6.00 × 15mins/60 mins)	1.50
	£3.70

(b) Overheads absorbed on a labour hours basis

The overhead absorption rate is:

$$\frac{£120\,000}{40\,000} = £3.00 \text{ per machine hour}$$

The production cost of one bayleaf grinder is:

Prime cost	2.20
Overhead (£3.00 × 10mins/60 mins)	0.50
	£2.70

6. Combe Cullen Systems Limited

(a) Overhead absorption rate based on machine hours

Estimate of production overheads for 20X6: £168 970

Total machine hours = 11 000

$$\text{Rate per machine hour} = \frac{£168\,970}{11\,000} = £15.36 \text{ per hour}$$

(b) Overhead per unit using ABC system

Cost per unit of cost driver:

Activity			Cost amount £
Machining	Overhead	= 63 030	£5.73 per machine hour
	Machine hours	11 000	
Assembly	Overhead	= 43 020	£4.78 per labour hour
	Labour hours	9 000	

Packing	Overhead	= 31 000	£7.75 per labour hour
	Labour hours	4 000	
Materials ordering	Overhead	= 9 990	£90 per order
	No. of orders	111	
Materials issue	Overhead	= 12 000	£80 per issue
	No. of issues	150	
Machine set up	Overhead	= 5 940	£180 per hour
	No of hours	33	
Quality inspection	Overhead	= 3 990	£114 per inspection
	No of inspections	35	

Allocation of overhead between product A and product B:

		Product A		Product B
		£		£
Machining	6000 × £5.73	34 380	5000 × £5.73	28 650
Assembly	3000 × £4.78	14 340	6000 × £4.78	28 680
Packing	2000 × £7.75	15 500	2000 × £7.75	15 500
Materials ordering	86 × £90	7 740	25 × £90	2 250
Materials issues	103 × £80	8 240	47 × £80	3 760
Machine set up	25 × £180	4 500	8 × £180	1 440
Quality inspection	10 × £114	1 140	25 × £114	2 850
Total		85 840		83 130

(c) Production cost of one unit of each product under ABC system

	A	B
Total production overhead	£85 840	£83 130
Number of units planned for production	6 000	5 000
Production overhead per unit	£14.31	£16.63
Prime cost per unit	12.50	16.00
Production cost per unit	26.81	32.63

Production cost of one unit of each product under the old costing system

Prime cost per unit	£12.50	£16.00
Production overhead for one machine hour	15.36	15.36
Production cost per unit	27.86	29.36

(d) Under both systems the production cost of A is less than the production cost of B. However, there is a greater difference between A and B under the ABC system of costing: A's cost is lower under ABC whereas B's cost is higher. Although product A involves a much higher number of materials orders and issues and higher machine set up costs, this is more than offset by the key factor which is the much lower number of labour hours involved in the assembly of product A. Because the company has traditionally absorbed production costs via machine hours, the much lower input of labour hours into A's assembly has been ignored. One of the advantages of the ABC system is that it is much more 'fine-tuned' in this respect.

However, it should be noted that a great deal of work has been involved in collecting and analysing the data relating to production. Some might argue that the benefit of the more accurate cost provided by ABC is more than offset by the high cost of collecting the relevant data.