CAT-T4

Topic-Wise Past papers

Accounting for Costs [INT]

June '04
To
December '08

Material
Costing

Topic-Wise | Past exam Papers

1

A company uses Material M in the manufacture of its products. The order quantity of the material is 1,000 kg. Average usage is 400 kg per week and a safety stock of 500 kg is kept. Lead time between order and receipt is two weeks.

Receipts and issues of Material M over a three week period were:

			Kg	Total cost (£)
Week 1:	Day 1	Balance b/f	900	10,800
	Day 3	Issue	400	
	Day 5	Receipt	1,000	12,600
Week 2:	Day 2	Issue	260	
	Day 4	Issue	170	
Week 3:	Day 3	Issue	370	

Required:
Calculate in relation to Material M the:
(a) Re-order level;   (3 marks)
(b) Total cost of the four issues in the three week period if the weighted average method is applied when each issue occurs;   (5 marks)
(c) Cost of the stock remaining at the end of the three week period if the Last-in First-out (LIFO) method is applied.   (4 marks)
[Sec: B, Q: 1 T4 June 2004]

2

Many manufacturing organisations hold raw material stocks.

Required:
(a) List three examples of holding costs.   (3 marks)
(b) List two examples of stockout costs.   (2 marks)

A manufacturing organisation uses 20,000 kilograms (kg) of a raw material evenly over a period. The material is purchased for £2·50 per kg, the cost of placing an order with the supplier is £60 and the cost of holding one kg of the material in stock for the period is 15% of the purchase price.

Required:
(c) Calculate the economic order quantity (EOQ) of the raw material (to the nearest kg).   (5 marks)
(d) Calculate the total holding costs of the raw material in the period if the order quantity is 3,000 kg and buffer stock is 1,000 kg.   (5 marks)
[Sec: B, Q: 3 T4 June 2005]

3(a)

Material X is used by a company in the manufacture of one of its products, Product Z. Demand for Product Z for the next year is forecast to be 26,000 units.

Each finished unit of Product Z contains 0·72 kilograms of Material X. There is a preparation loss of 10% of material used. It is not planned to change the stock-holding of Product Z in the year ahead but a reduction of 1,000 kilograms in the stock of Material X is planned.

Required:
Calculate the quantity of Material X that needs to be purchased in the year ahead.   (4 marks)

3(b)

Material Y is also used in the manufacture of Product Z and in several other products. The total annual requirement for Material Y is 120,000 litres, used evenly over each year.

The costs of ordering stock and holding stock are as follows:
Ordering £45 per order
Holding £0·30 per litre per annum

A safety stock of 2,500 litres of Material Y is held and the average lead time (the interval between placing an order for materials and having them delivered) is 1·5 weeks.

Required:
Calculate for Material Y the:
(i) Economic order quantity, using the formula   (4 marks)
(ii) Reorder level (assume 1 year = 50 weeks);   (4 marks)
(iii) Total annual cost of ordering stock;   (3 marks)
(iv) Total annual cost of holding stock.   (3 marks)
[Sec: B, Q: 2 T4 June 2007]

4

At the beginning of Month 2, the balance in the stores ledger for Material M27 was 2,400 kg at $3·60 per kg. The movements of the material in Month 2, and the prices per kg, were as follows:

Day	Receipts		Issues	
	Quantity kg	Price $/kg	Quantity kg	Price $/kg
4	5,000	3·65		
6			4,000	3·65
17	6,000	3·70		

Required:
(a) State the pricing method used to value the material issues on Day 6.   (2 marks)
(b) Calculate the closing inventory value at the end of Month 2.   (3 marks)

In Month 3, no further purchases of Material M27 were made. Issues in the month were:
Day 2   3,200 kg
Day 10   4,300 kg

Required:
(c) Prepare the inventory record for Material M27 for Month 3, showing both the quantity AND the value of:
(i) Each of the issues; and   (4 marks)
(ii) The balance remaining after each issue.   (4 marks)
[Sec: B, Q: 1 T4 June 2008]

CAT
T4

Labour
Costing

1

Costs relating to labour turnover may be classified as:

(i) Replacement costs
(ii) Preventative costs.

Required:
Give TWO examples of costs within EACH of the above classifications and state a formula used to calculate the rate of labour turnover. (6 marks)

A company manufactures a single product at the rate of 25 units per direct labour hour. 660 direct labour hours were budgeted to be worked in a period during which 640 hours were actually worked and 16,390 units were manufactured.

Required:
Calculate the following ratios for the period:
(i) Efficiency;
(ii) Capacity;
(iii) Production volume. (10 marks)
[Sec: B, Q: 1 T4 December 2004]

2

A company manufactures three products. Sales demand for the products in the next period is estimated to be:
Product A 6,200 units
Product B 8,000 units
Product C 11,500 units

Selling prices and unit costs are:

	Product A	Product B	Product C
	£ per unit	£ per unit	£ per unit
Selling price	9·70	11·10	13·80
Costs:			
Direct materials	2·80	3·90	4·92
Direct labour (£8·00 per hour)	2·40	2·40	3·20
Variable overhead	0·90	0·90	1·20
Fixed overheads	2·70	2·70	3·60

The company is experiencing a shortage of direct labour and estimates that a maximum of 8,500 hours will be available in the next period.
Required:
(a) Demonstrate that the availability of direct labour will be a limiting factor in the next period. (4 marks)
(b) Determine the production schedule for the next period that will maximise profit. (10 marks)
[Sec: B, Q: 4 T4 December 2004]

3

A company manufactures a single product. Currently, the company employs a team of six direct operatives who produce a total of 2,500 units of the product in a 40-hour week. The hourly rate of pay for all operatives is £8·00.

In an effort to improve productivity, and thus to increase output in the normal 40-hour week, an incentive scheme has been suggested. The scheme, which the six operatives have agreed to trial over a 4-week period, provides for differential piecework payments in addition to a reduced basic rate per hour.

Details of the scheme are:

Basic hourly rate	£4·00 per hour

Differential piecework rates:

First 2,500 units of output in a week	£0·375 per unit
Output 2,501 to 3,000 units in a week	£0·45 per unit on additional units over 2,500
Output over 3,000 units in a week	£0·60 per unit on additional units over 3,000

In the first week of the trial, total output was 3,080 units in the 40 hours worked.

Required:
(a) For the existing time rate payment system, calculate:
(i) The labour cost per unit, based on the current weekly output of 2,500 units; (2 marks)
(ii) The % change in the labour cost per unit if weekly output in the 40 hours worked could be increased to 2,750 units. (2 marks)

(b) For the incentive scheme, calculate:
(i) The labour cost per unit, based on the results of the first week of the trial; (6 marks)
(ii) The level of output in a 40 hour week at which total labour cost would be the same as under the existing time rate payment system. (5 marks)

[Sec: B, Q: 1 T4 December 2006]

4

(a) Describe briefly how the following are used in the accounting for labour:
(i) time sheets; (3 marks)
(ii) job cards. (3 marks)

(b) The following details relate to the labour in a production cost centre for a period:

	Direct personnel	Indirect personnel
Hourly rates of pay:		
Basic	$10·00	$7·00
Overtime	$13·00	$9·10
Payroll hours:		
Productive	310	118
Idle	18	4
Total	328	122

Additional information:
1. The basic rates of pay apply to a normal working week of 38 hours
2. There are eight direct personnel and three indirect personnel in the cost centre
3. Overtime is worked from time to time to meet the general requirements of production
4. Idle time is regarded as normal.

Required:
Calculate the total amounts:
(i) Paid to the direct personnel and the indirect personnel respectively; (6 marks)
(ii) Charged as direct wages to work-in-progress and indirect wages to overheads respectively (show clearly the make-up of the indirect charge). (6 marks)

[Sec: B, Q: 4 T4 December 2008]

Overheads Costing

1

Production overheads allocated and apportioned to cost centres in a factory for a period, along with additional data, are:

	Production Cost Centre			Service Cost Centre	
	A	B	C	X	Y
Allocated overheads	£17,628	£38,490	£14,671	£3,795	£6,130
Apportioned overheads	£29,938	£45,841	£28,360	£4,640	£5,750
Additional data:					
Number of employees	14	21	14	7	8
Direct labour hours	5,200	7,460	4,780	–	–

Overheads allocated and apportioned to Service Cost Centre X are re-apportioned on the following basis: Production Cost Centre A 20%, Production Cost Centre B 45%, Production Cost Centre C 35%.

Overheads allocated and apportioned to Service Cost Centre Y are re-apportioned on the basis of the number of employees in the other cost centres.

Production overheads are absorbed on the basis of direct labour hours.

Required:
(a) Re-apportion the service cost centre overheads.   (7 marks)
(b) Calculate an overhead absorption rate for each production cost centre.   (3 marks)

(c) Calculate the total production cost of <u>Job 57</u>. Direct production costs of the job are:

Direct materials   £1,678
Direct labour:
   Cost Centre A   £288 (36 hours)
   Cost Centre B   £425 (50 hours)
   Cost Centre C   £304 (32 hours).   (4 marks)

[Sec: B, Q: 2 T4 June 2004]

2(a)

State an appropriate basis of apportionment for each of the following production overhead costs:

(i) Factory rent;
(ii) Staff canteen.   (4 marks)

2(b)

Overheads allocated, apportioned and re-apportioned to the two production cost centres in a factory for a period were:

	Production Cost Centre	
	X	Y
Budget	£161,820	£97,110
Actual	£163,190	£96,330

Overheads are absorbed using predetermined rates. A machine hour rate is used in Production Cost Centre X and a direct labour hour rate in Production Cost Centre Y. Machine and direct labour activity in each production cost centre is:

	Production Cost Centre	
	X	Y
Machine hours:		
Budget	8,700	1,760
Actual	8,960	1,725
Direct labour hours:		
Budget	6,220	8,300
Actual	6,276	7,870

Required:
Calculate for each production cost centre for the period:
(i) The predetermined production overhead absorption rate; (3 marks)
(ii) The production overheads absorbed; (3 marks)
(iii) The over/under absorption of production overhead. (4 marks)

[Sec: B, Q: 2 T4 December 2005]

3

There are two production cost centres (P1 and P2) and two service cost centres (Materials Store and Employee Facilities) in a factory. Estimated overhead costs for the factory for a period, requiring apportionment to cost centres, are:

	£
Buildings depreciation and insurance	42,000
Management salaries	27,000
Power to operate machinery	12,600
Other utilities	9,400

In addition, the following overheads have been allocated to cost centres:

Cost Centre			
P1	P2	Materials Store	Employee Facilities
£107,000	£89,000	£68,000	£84,000

Further information:

	Cost Centre				Total
	P1	P2	Materials Store	Employee Facilities	
Floor area (m$_2$)	4,560	5,640	720	1,080	12,000
Number of employees	18	24	6	6	54
Share of other utilities overhead	35%	45%	10%	10%	100%
Machine hours	6,200	5,800			12,000
Share of Materials Store overheads	40%	60%			100%

Required:
(i) Prepare a schedule showing the allocated and apportioned factory overhead costs for each cost centre; (7 marks)
(ii) Re-apportion the service cost centre overheads. (4 marks)

[Sec: B, Q: 3 T4 June 2006]

4

A company has three production departments (X, Y and Z) in its factory. After completion of all overhead allocation and apportionment, the production department budgets for Year 6 included the following:

	Department		
	X	Y	Z
Overhead costs	£51,240	£87,120	£66,816
Direct labour hours	–	–	11,520
Machine hours	4,200	5,280	–

A predetermined overhead absorption rate is established for each production department each year.

Actual data for Month 1 of Year 6 included:

	Department		
	X	Y	Z
Overhead costs	£4,410	£7,190	£5,610
Direct labour hours	–	–	985
Machine hours	340	426	–

Required:
(a) Calculate, from the data provided, an appropriate predetermined overhead absorption rate for each production department for Year 6. (4 marks)
(b) Calculate the amount of the over/under absorption of overhead in Month 1 in each production department and in total for the factory. (9 marks)
(c) Suggest two general causes of overhead under absorption. (3 marks)

[Sec: B, Q: 2 T4 December 2006]

5(a)

A company has three production cost centres (P1, P2 and P3) and two service cost centres (S1 and S2) in its factory. The actual production overhead costs for a period, totalling £487,430, have been allocated and apportioned to cost centres as follows:

Production cost centre			**Service cost centre**	
P1	P2	P3	S1	S2
£176,860	£96,250	£134,770	£42,150	£37,400

The overheads of service cost centre S1 are reapportioned on the basis of the number of materials requisition notes (MRN) raised in the period. The overheads of service cost centre S2 are reapportioned on the basis of the number of employees in the other cost centres. The following additional actual information is available for the period:

Cost centre	Number of employees	Number of MRNs
P1	20	4,970
P2	25	3,550
P3	50	5,680
S	1	8
S	2	5

Required:
(a) Reapportion the service cost centre overheads. (7 marks)

5(b)

The predetermined production overhead rates for the period, used to absorb overheads, are:

P1	£24·60 per machine hour
P2	£13·40 per direct labour hour
P3	£10·80 per direct labour hour

Machine hours and direct labour hours in each production cost centre are:

Cost centre	Machine hours		Direct labour hours	
	Budget	Actual	Budget	Actual
P1	8,100	8,250	3,650	3,680
P2	1,960	1,880	8,650	8,440
P3	3,610	3,720	15,600	15,990

Required:
Calculate for the period for each production cost centre:
(i) The amount of overheads absorbed; (3 marks)
(ii) The amount of any over or under absorption of overheads. (6 marks)
[Sec: B, Q: 4 T4 June 2007]

6

The following information is available for two production cost centres in a factory for a period:

	Cost centre X	Cost centre Y
Budgeted costs	$28,556	$54,264
Budgeted hours	1,210 machine hours	6,460 labour hours
Predetermined absorption rate	$23·60 per machine hour	$8·40 per labour hour
Actual costs	$29,609	$52,567
Actual hours	1,235 machine hours	6,395 labour hours

Required:
(a) Calculate the over or under absorption of overhead for the period in each cost centre. (6 marks)
(b) Explain two advantages of using predetermined, as opposed to actual, overhead absorption rates.
(4marks)
[Sec: B, Q: 3 T4 December 2007]

7

Three of the cost items that are included in the production overhead budget for a factory for a period are:

Machine maintenance labour	$33,600
Power	$26,000
Rent and rates	$39,800

Production overheads are currently absorbed using a single factory-wide rate.

It has been suggested that a separate overhead absorption rate should be calculated for each of the three groups of machines in the factory. The following additional budgeted data has been collected for the period:

	Machine Group			Total
	MG1	MG2	MG3	
Floor area (m2)	1,600	1,400	1,000	4,000
Machine values ($'000)	320	250	230	800
Kilowatt hours ('000)	220	110	110	440
Machine maintenance (labour hours)	600	400	600	1,600
Number of indirect workers	4	4	2	10
Machine hours	8,200	5,600	4,900	18,700

Required:
(a) Briefly explain one reason why a separate overhead absorption rate for each machine group would be preferable to a single factory-wide rate. (2 marks)
(b) Apportion each of the three items of budgeted overhead cost (machine maintenance labour, power and rent and rates) to the three machine groups. (7 marks)

The totals of ALL budgeted production overhead cost items, allocated and apportioned to the three machine groups, are as follows:

MG1 $129,560
MG2 $107,520
MG3 $119,070

Required:
(c) Calculate an appropriate absorption rate for each machine group. (3 marks)
(d) Calculate the production overhead that would be charged to Job J21 which requires five hours on MG1 machines, two hours on MG2 machines and three hours on MG3 machines. (3 marks)

[Sec: B, Q: 3 T4 June 2008]

Job Costing

1

A company manufactures carpet for the hotel industry. No finished stocks are carried as the company only manufactures specifically to customer order. At the end of Month 6, one incomplete job (Job X124) remained in progress. Production costs incurred on the job to the end of Month 6 were:

Direct material £7,220
Direct labour £6,076
Production overhead £10,416

During Month 7, the company accepted two further jobs (Jobs X125 and Job X126) and incurred prime costs as follows:

	Job X124	Job X125	Job X126
Direct material issued from stores	£6,978	£18,994	£12,221
Direct material returned to stores	Nil	(£700)	(£2,170)
Direct material transfers	Nil	£860	(£860)
Direct labour hours	780	2,364	1,510

Direct labour is paid at a rate of £7.00 per hour. Production overheads are absorbed at a rate of £12·00 per direct labour hour.

During Month 7, Jobs X124 and X125 were completed. On completion of a job, 20% of the total production cost is added in order to recover distribution, selling and administration costs. The amounts invoiced to customers during Month 7 for the completed jobs were:

Job X124 £60,000
Job X125 £79,000

Required:
(a) For each of the jobs calculate the following total costs:
I.	**Direct material;**	(3 marks)
II.	**Direct labour;**	(3 marks)
III.	**Production overhead.**	(3 marks)

(b) Calculate the total cost and profit/(loss) of each of Job X124 and Job X125. **(**4 marks)

[Sec: B, Q: 2 T4 Pilot Paper]

2

Give an example of a business where job costing may be applied and describe the features of this type of business which make the costing method appropriate; (4 marks)

[Sec: B, Q: 3(a)(i) T4 June 2004]

3

Company X is preparing a job cost estimate that will be used to provide a quote for a potential customer. Estimated costs for the job are to be based on the following:

Direct materials	£2,893
Direct labour	210 hours at a basic rate of £8·00 per hour. Direct production staff also receive a bonus each period. The bonus is paid on actual hours worked at a rate per hour calculated using the following formula:
	{[(time allowed – time worked) / time allowed] – basic rate per hour}
	The bonus to be included currently in the costing of all jobs is based on the following estimates for the period:
	• Total time worked 3,400 labour hours
	• Total time allowed 4,000 labour hours
Production overheads Absorbed	at 20% of prime cost (including labour bonus) + £9·00 per direct labour hour
Non-production overheads Absorbed	at 25% of total production cost

Quoted prices are calculated to provide Company X with a net profit margin of 20% of sales.

Required:
(a) Calculate the total estimated PRODUCTION cost of the job. (10 marks)
(b) Calculate the price that should be quoted for the job. (4 marks)

Service Costing

1

Describe the main ways in which the costing of services differs from the costing of manufactured products. (6 marks)

[Sec: B, Q: 3(i) T4 December 2004]

2

A transport business operates a fleet of 10 vehicles. Operating data are as follows:

Purchase of vehicles (depreciated on a straight-line basis over 4 years)	£460,000 (for 10 vehicles)
Vehicle disposal value (after 4 years)	£4,000 (per vehicle)
Road fund licence and insurance	£2,290 (per vehicle per year)
Tyres (8 per vehicle renewed every 40,000 kilometres)	£210 (per tyre)
Servicing (every 16,000 kilometres)	£650 (per vehicle service)
Fuel (consumption of 1 litre per 3·2 kilometres)	£0·80 (per litre)
Vehicle usage	80,000 kilometres (per vehicle per year)
Drivers (1 driver per vehicle)	£18,000 (per driver per year)

Required:
Calculate the total vehicle operating costs per kilometre (to four decimal places of £). (10 marks)

[Sec: B, Q: 3(ii) T4 December 2004]

3

A passenger transport company operates four coaches, each with a capacity for 25 passengers. The company operates on two routes with two coaches on each route. Each coach on Route A completes 12 journeys per day and on Route B 10 journeys per day. The coaches operate for six days per week and for 52 weeks per year.

The company is analysing performance on each route and has gathered the following route data for the last 52 weeks:

	Route A	Route B
Average number of passengers per journey	13	11
Average fare paid per passenger, per journey	$2·26	$2·80
Route length per journey (kilometres)	14	19

Operating cost data for the last 52 week period is as follows:

Drivers' wages:	$110 per coach per working day
Fuel and maintenance:	$0·8932 per kilometre
Vehicle tax and insurance:	$3,870 per coach for the period
Apportioned fixed costs:	$21,760 per route for the period

Required:
Calculate, for the 52 week period, the:
(a) Total cost per coach on each route; (10 marks)
(b) Cost per kilometre on each route (to four decimal places of $); (5 marks)
(c) Profit per kilometre on each route. (5 marks)

[Sec: B, Q: 2 T4 December 2007]

Absorption and Marginal Costing

Topic-Wise | Past exam papers

1

A company manufactures a single product with a selling price of £28 per unit. Variable production costs per unit of product are:
Direct material £6·10
Direct labour £5·20
Variable overhead £1·60

Fixed production overheads are £30,000 per month. Administration overheads are semi-variable in nature: variable costs are 5% of sales and fixed costs are £13,000 per month.

Production and sales quantities over a two month period are:

	Production	Sales
Month 1	4,000 units	3,500 units
Month 2	3,600 units	3,800 units

There is no finished goods stock at the beginning of Month 1.

The company has prepared the following profit statement for each of the two months using the absorption costing method:

Profit statement

	Month 1		Month 2	
	£	£	£	£
Sales		98,000		106,400
Production cost of sales:				
Opening stock	–		10,200	
Cost of production	81,600		76,440	
Closing stock*	(10,200)	71,400	(6,370)	80,270
Gross profit		26,600		26,130
Administration overhead		17,900		18,320
Net profit		8,700		7,810

* Stock valuation: end Month 1 £81,600 × (500 ÷ 4,000 units)
                     end Month 2 £76,440 × (300 ÷ 3,600 units)

Required:
(a) Prepare a profit statement for each of the two months using the marginal costing method. (10marks)
(b) Provide a reconciliation of the absorption costing and marginal costing profits for Month 2, supported by a full explanation of the difference. (7 marks)
[Sec: B, Q: 1 T4 Pilot Paper]

2

A company has the following costs for its single product, based on planned production and sales of 46,000 litres in a period:

	£ per litre
Prime costs	5·20
Production overhead – all fixed	2·80
Non-production overhead	
– variable	0·65
– fixed	1·70
	£10·35

Actual production and sales in the period were:
Production   46,000 litres

Sales   45,600 litres (at £12·00 per litre)

There was no finished stock at the beginning of the period. Variable costs per litre and total fixed costs in the period were as planned. Variable non-production overheads vary in total with the number of litres sold.

Required:
(a) Prepare a profit statement for the period using absorption costing. (8 marks)
(b) Explain fully why, and calculate by how much, the profits for the period would be different if marginal costing was used instead. (6 marks)
[Sec: B, Q: 1 T4 June 2005]

3

A book publisher makes an initial payment of £25,000 to authors for each accepted manuscript, followed by a royalty payment of 15% of the net sales price of each book sold.

The net sales price of a book, which is the revenue received by the publisher, is the listed selling price in bookstores less the bookstore margin of 20% of the listed selling price.

A particular book has a listed selling price of £15·00. Costs incurred on the book by the publisher (excluding initial and royalty payments to the author) are:
Variable costs per copy   £3·20
Total fixed costs   £80,000

Required:
(a) Calculate the number of copies of the particular book that need to be sold for the publisher:
(i) to break even; (9 marks)
(ii) to make a profit of £35,000. (3 marks)

(b) Prepare a profit/volume (P/V) chart for the publisher, relating to the particular book publication, covering sales up to 25,000 copies. (5 marks)
[Sec: B, Q: 4 T4 June 2005]

4

The following is a list of unit costs for a single product, incurred in a period, using either marginal costing or absorption costing:

	Marginal costing		Absorption costing	
	$	$	$	$
Production costs:				
Prime cost	4·20		4·20	
Variable overhead	0·60		0·60	
Fixed overhead	–		3·80	
		4·80		8·60
Selling & administration costs:				
Variable overhead	1·00		1·00	
Fixed overhead	–		2·90	
		1·00		3·90
Total		5·80		12·50

The selling price of the product, throughout the period, was $14·50 per unit. 11,400 units of the product were manufactured in the period during which 11,200 units were sold. There were no finished goods at the beginning of the period. The fixed production overhead costs per unit listed above are based on the production units for the period and the fixed selling and administration overhead costs per unit are based on the sales units.

Required:
(a) Prepare an absorption costing profit statement for the period. The statement should include the total cost of production, closing inventory value, total gross profit and total net profit. (8 marks)

(b) Using marginal costing, calculate for the period:
(i) Total contribution; (3 marks)
(ii) Total net profit; (3 marks)
(iii) Break-even sales revenue. (3 marks)
(c) Explain why the net profit using absorption costing differs from that using marginal costing. (2 marks)
[Sec: B, Q: 1 T4 December 2007]

Break Even
&
CVP Analysis

1

A company manufactures three products. Sales demand for the products in the next period is estimated to be:

Product A 6,200 units
Product B 8,000 units
Product C 11,500 units

Selling prices and unit costs are:

	Product A	Product B	Product C
	£ per unit	£ per unit	£ per unit
Selling price	9·70	11·10	13·80
Costs:			
Direct materials	2·80	3·90	4·92
Direct labour (£8·00 per hour)	2·40	2·40	3·20
Variable overhead	0·90	0·90	1·20
Fixed overheads	2·70	2·70	3·60

The company is experiencing a shortage of direct labour and estimates that a maximum of 8,500 hours will be available in the next period.

Required:
(a) Demonstrate that the availability of direct labour will be a limiting factor in the next period. (4 marks)
(b) Determine the production schedule for the next period that will maximise profit. (10 marks)

[Sec: B, Q: 4 T4 December 2004]

2(a)

Company A manufactures and sells a single product. The following information is available:

Selling price per unit   £60·00
Variable costs per unit   £36·00
Fixed costs per period   £216,000

Required:
(i) Draw a profit/volume (P/V) chart based on sales up to 14,000 units per period. (8 marks)
(ii) Clearly identify the break-even point, and areas of profit and loss, on the chart. (2 marks)

2(b)

Company B manufactures and sells three products. The following information is available:

	Product A	Product B	Product C
Selling price per unit	£10·00	£12·50	£18·70
Variable costs per unit	£5·20	£7·50	£9·35
Machine hours per unit	0·6	0·5	1·0
Direct labour hours per unit	1·0	1·2	2·5

The company wishes to maximise profit each period.

Required:
(i) Calculate the contribution/sales (C/S) ratio of each of the products; (2 marks)
(ii) List the products in the order of their production priority (i.e. most profitable product first) in EACH of the following situations:
(1) if machine hours are the limiting factor; (3 marks)
(2) if direct labour hours are the limiting factor. (3 marks)

[Sec: B, Q: 4 T4 December 2005]

3

A profit/volume (P/V) chart of two companies (A and B) for a period follows:
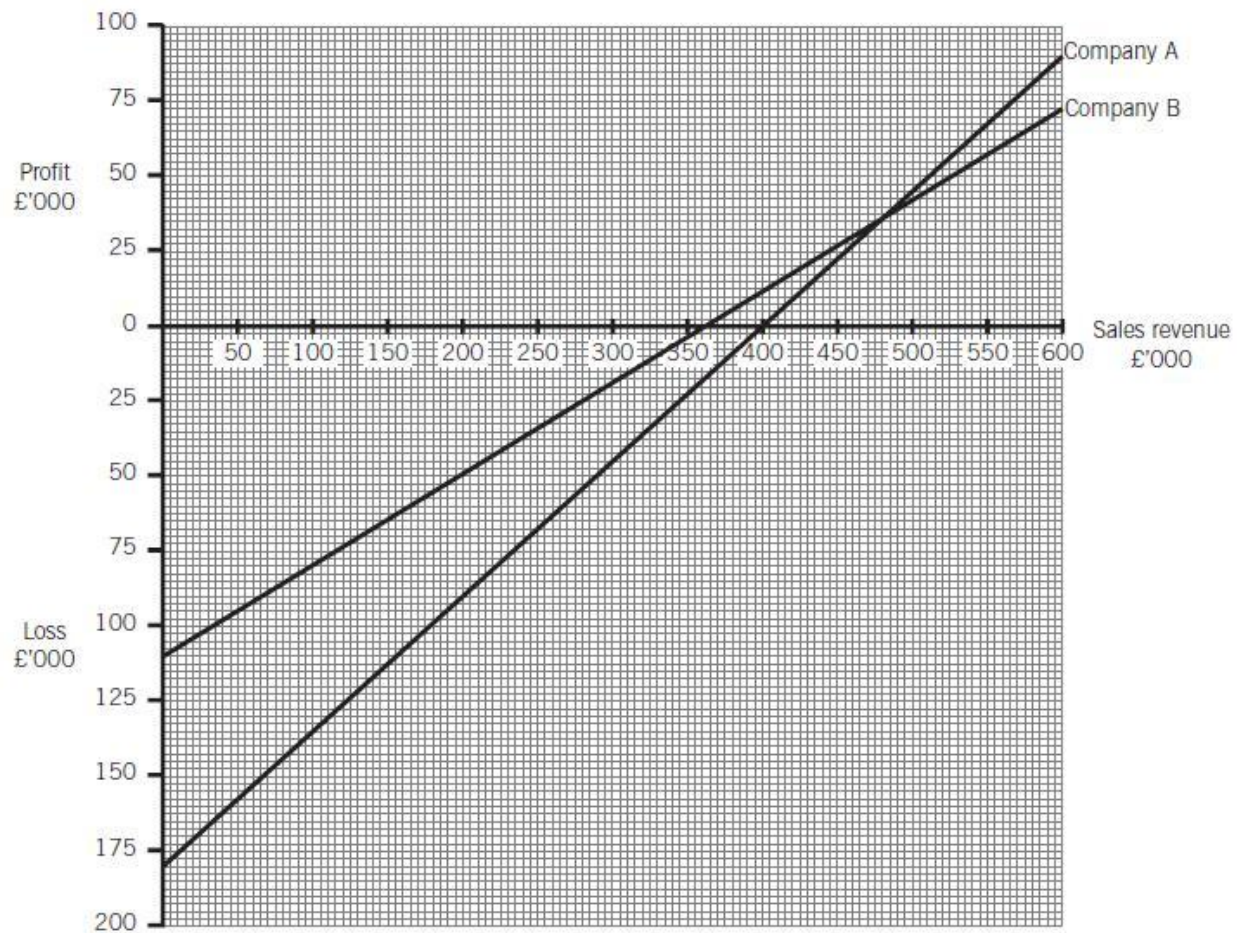
Required:

(a) By reference to the above chart:
(i) Estimate the break-even sales revenue of Company A;   (2 marks)
(ii) Estimate the total fixed costs of Company A;   (2 marks)
(iii) State which company has the higher contribution/sales ratio (justify your conclusion); (3 marks)
(iv) Estimate the level of sales at which the profit of the two companies is the same.   (2 marks)

(b) Calculate the contribution/sales ratio of Company A and use this to confirm, by calculation, the break-even point identified in (a) (i) above.   (4 marks)

[Sec: B, Q: 2 T4 June 2006]

Topic-Wise | Past exam Papers

4

The variable costs per unit of a company's single product for the period just ended were:

	£
Production	120
Non-production	16

The selling price of the product in the period was £200 per unit and the sales revenue required to break-even was £120,000.

Required:
(a) Calculate for the period just ended:
(i) The contribution/sales ratio; (3 marks)
(ii) The total fixed costs. (3 marks)

(b) In the following period it is expected that fixed costs will total £39,000.
Required:
Calculate the required contribution per unit in the following period for the break-even point to be 500 units.
(4 marks)
[Sec: B, Q: 3 T4 June 2007]

5

A garage operates a vehicle repair service. Space is limited and, although the garage is usually busy, the owner is concerned about the amount of profit that can be generated. Summarised data concerning vehicle repairs follows:

Average number of repairs per period	85
Average variable cost of each repair	$126
Average sales value of each repair	$210

The owner is considering extending the garage opening hours. This would result in an increase in fixed costs from $6,972 to $7,728 per period. The average variable cost and the average sales value of each repair would be expected to remain the same.

Required:
(a) For the current situation, calculate per period the:
(i) Profit; (3 marks)
(ii) Break-even sales revenue. (4 marks)
(b) For the proposed extended opening hours, calculate the average number of repairs required per period to achieve the current level of profit. (4 marks)
[Sec: B, Q: 2 T4 December 2008]

Process
Costing

1

Chemicals X, Y and Z are produced from a single joint process. The information below relates to the period just ended:

Input to process:	Direct materials	3,200 litres, cost £24,000
	Direct labour	£48,000
	Factory overheads are absorbed at 120% of prime cost	

Output from process:	Chemical X	1,440 litres
	Chemical Y	1,864 litres
	Chemical Z	1,576 litres
	Scrap	10% of input, credited to the process account at sales value as it occurs

Selling prices:	Chemical X	£100 per litre
	Chemical Y	£80 per litre
	Chemical Z	£60 per litre
	Scrap	£16 per litre

Required:
Calculate for the period just ended:
(a) The joint process costs to be apportioned to the joint products; (4 marks)
(b) The total sales value of the output of the three products; (2 marks)
(c) The share of the joint process costs charged to Chemical X, using the volume of output method of apportionment; (3 marks)
(d) The share of the joint process costs charged to Chemical Y, using the sales value method of apportionment. (3 marks)

[Sec: B, Q: 3 T4 Pilot Paper]

2

Give an example of a business where process costing may be applied and describe the features of this type of business which make the costing method appropriate. (4 marks)

[Sec: B, Q: 3(a)(ii) T4 June 2004]

A company manufactures a product by means of two successive processes, Process 1 and Process 2. The following relates to the period just ended:

	Process 2	
	Units	Cost (£)
Opening work-in-progress	Nil	Nil
Transfer from Process 1	2,160	22,032
Material added		5,295
Conversion costs		8,136
Transfer to finished goods warehouse	1,950	
Closing work-in-progress	210	

The work-in-progress at the end of the period was 80% complete with respect to material added and 40% complete with respect to conversion costs in Process 2.

Required:
Calculate for the period the:
(i) Production cost per equivalent unit of the product; (6 marks)
(ii) Value of the transfer to the finished goods warehouse; (2 marks)
(iii) Value of the closing work-in-progress in Process 2. (3 marks)

[Sec: B, Q: 3(b) T4 June 2004]

3

600 tonnes of raw material, costing £430,032, were input to a process in a period. Conversion costs totaled £119,328. Losses, in the form of reject product, are normally 12% of input. Reject product is sold for £260·00 per tonne.

521 tonnes of finished product passed inspection in the period. The remaining output was sold as reject product. There was no work-in-progress either at the beginning or the end of the period.

Required:
For the period:
(a) Calculate the cost per unit of normal output. (8 marks)
(b) Prepare the process account, including any abnormal losses/gains. (6 marks)
[Sec: B, Q: 2T4 June 2005]

4

In another process operation joint products A and B are produced. Joint costs, apportioned on the basis of weight of output, are £9·80 per kg. Product A can be sold at the split-off point for £9·00 per kg.

Alternatively the product can be processed further, at an incremental cost of £2·10 per kg, and sold as Product AA at a price of £11·50 per kg.

Required:
Comment on EACH of the following statements concerning Product A:
(i) The product should be processed further because if sold as Product A the selling price is below cost;
(3 marks)
(ii) The product should be processed further because profit would increase (show calculations clearly to support your comment). (4 marks)
[Sec: B, Q: 4(b) T4 June 2006]

5

A company manufactures two products, Product A manufactured in Process Y and Product B manufactured in Process Z. The following information is available for a period:

	Process Y	Process Z
Opening work-in-progress	Nil	Nil
Raw materials input	$162,180 (18,000 kg)	$210,090
Conversion costs	$94,050	$287,760
Waste material	1,000 kg (Note 1)	Nil
Sales value of waste material	$1·60 per kg	Nil
Output of finished product	17,000 kg	12,600 units
Closing work-in-progress	Nil	1,500 units (Note 2)

Note 1
In Process Y the normal amount of waste material is 5% of the weight of raw materials input.

Note 2
In Process Z the closing work-in-progress is 100% complete as to raw materials and 60% complete as to conversion costs.

Required:
(a) For Process Y, calculate the:
(i) Cost per kg of the expected production of Product A; and (8 marks)
(ii) Total cost of the finished output of Product A. (2 marks)
(b) For Process Z, calculate the equivalent units of production of Product B in respect of conversion costs.
(3 marks)
[Sec: B, Q: 2 T4 June 2008]

6

The following data is provided for a chemical process for a period:

Materials input	29,000 kg (kilograms) at a total cost of $162,342
Conversion cost	$74,700
Opening work-in-progress	Nil
Closing work-in-progress	3,000 kg, 60% complete as to conversion costs

There is a preparation loss at the start of the process operation. Actual losses in the period were at the normal level of 10% of the materials input.

Required:
For the period:
(a) Calculate the cost per kg (kilogram) of production. (6 marks)
(b) Prepare the process account (showing kg as well as value). (9 marks)

[Sec: B, Q: 3 T4 December 2008]

CAT
T4

Joint & By-product Costing

1

A company manufactures Products A and B jointly in a single operation. The following information relates to the most recent period:

	Kg	Costs (£)
Raw material input	120,000	432,000
Conversion costs		348,000
Output – Product A	72,000	
– Product B	48,000	

Product A is sold for £8·60 per kg. Product B can be sold for £7·80 per kg or alternatively can be further processed to produce the same weight of Product BB. Further processing costs are £1·40 per kg. Product BB can be sold for £9·00 per kg.

Required:
(a) Calculate the profit/loss in the period for each product and in total, assuming:
    i.   All output was sold as Products A and B; and
    ii.   Joint costs were apportioned on the basis of weight of output. (8 marks)
(b) Determine whether further processing of Product B is worthwhile. (6 marks)
[Sec: B, Q: 2 T4 December 2004]

2

Two products (Y and Z) are jointly produced in a single process. Joint costs for a period totalled £52,000. Output of the two products in the period was:

Product Y	2,000 units
Product Z	3,500 units

There was no opening or closing work-in-progress or finished goods stock.

Both products are currently sold without further processing for:

Product Y	£12·00 per unit
Product Z	£16·00 per unit

Sales values are used as the basis for apportioning joint costs.

Required:
Prepare a statement showing the gross profit (in total and per unit) for each product in the period. (9 marks)
[Sec: B, Q: 4(a) T4 June 2006]

3

The following summary shows the selling prices, costs and output of joint products JP1 and JP2 from a manufacturing process:

	Product JP1	Product JP2
Selling price	$20·00 per kg	$10·00 per kg
Share of joint costs	$12·00 per kg	$12·00 per kg
Profit/(loss)	$8·00 per kg	($2·00) per kg
Output	100 kg	120 kg

Both products can be sold at the split-off point but Product JP1 can also be further processed to form Product FP1. Relevant selling price, cost and output information for Product FP1 is:

	Product FP1
Selling price	$25·00 per kg
Further processing costs	$3·50 per kg
Output	100 kg

Required:
(a) Calculate the total joint costs for the period and state the method used to apportion them in the situation above.
(3 marks)

(b) Comment on each of the following statements, justifying your comments with supporting calculations:
(i) Product JP2 should be discontinued because it makes a loss of $2·00 per unit; (4 marks)
(ii) Product JP1 should be further processed. (4 marks)

[Sec: B, Q: 4 T4 December 2007]

CAT
T4

Decision
Making

1

A company currently has spare labour hours in Department X and spare machine capacity in Department Z, and is considering each of the following independent opportunities:
1. Whether to quote for Contract W which would be completed in the near future.
2. Whether to take on sub-contract work for a period of three years.

1. Contract W:

The contract would be carried out without the need for any additional direct operatives in Department X where two existing operatives, each paid at a rate of £7·50 per hour for a guaranteed 37-hour week, would work on the contract for a total of 220 hours. In another department, Department Y, additional labour would have to be taken on at a cost of £2,400.

Total material costs for the contract are estimated at £5,740, based on replacement prices. Included in materials is Component M, a quantity of which is in stock. Component M is no longer used in the company's business.

Details of Component M are:
Stockholding 80 units

Required for Contract W	120 units
Purchase price of existing stock	£6·10 per unit
Disposal proceeds of existing stock if sold	£4·60 per unit
Replacement price	£6·50 per unit

Overheads would be absorbed on the contract on the following basis:

Production overheads	120% of direct labour cost (only 20% of the overheads absorbed would be an incremental cost)
Non-production overheads	40% of total production cost (none of the overheads absorbed would be an incremental cost)

2. Sub-contract work:

The sub-contract work would be carried out in Department Z, utilising existing machinery. The machinery is now surplus to requirements and would otherwise be sold. The net book value of the machinery is £140,000 but the current disposal value is only £120,000. If used for three years on the sub-contract work the disposal value would be expected to reduce to £10,000. The remaining net book value of the machinery would be depreciated on a straight-line basis over the three years.

Net cash inflows from the sub-contract work, occurring at the end of each year, are forecast to be:

Year 1	£40,000
Year 2	£55,000
Year 3	£60,000

Required:
(a) Calculate the minimum price that could be quoted for Contract W in order to recover incremental costs only. (Show workings clearly.) (10 marks)

(b) Calculate the net present value (NPV) for the sub-contract work at a cost of capital of 10% per annum.
Discount factors at 10%:

Year 1	0·909
Year 2	0·826
Year 3	0·751

(9 marks)

[Sec: B, Q: 4 T4 December 2006]

(a) Define the term 'limiting factor' and give an example. (3 marks)

(b) A company manufactures three products (X, Y and Z). All direct operatives are the same grade and are paid at $11 per hour. It is anticipated that there will be a shortage of direct operatives in the following period, which will prevent the company from achieving the following sales targets:

Product X   3,600 units
Product Y   8,000 units
Product Z   5,700 units

Selling prices and costs are:

	Product X $ per unit	Product Y $ per unit	Product Z $ per unit
Selling prices	100·00	69·00	85·00
Variable costs:			
Production*	51·60	35·00	42·40
Non-production	5·00	3·95	4·25
Fixed costs:			
Production	27·20	19·80	21·00
Non-production	7·10	5·90	6·20

*includes the cost of direct operatives 24·20 16·50 17·60

The fixed costs per unit are based on achieving the sales targets. There would not be any savings in fixed costs if production and sales are at a lower level.
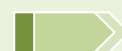
Required:
(i) Determine the production plan that would maximise profit in the following period, if the available direct operatives' hours total 26,400. (11 marks)
(ii) Calculate the total net profit in the following period based on the production plan in (b) above.
(5 marks)

Investment Appraisal

1

(a) Distinguish between net profit and net cash flow and explain the rationale for discounting cash flows in the appraisal of capital investment project viability. (6 marks)

(b) A company is considering an investment in new equipment. The company has a cost of capital of 12% per annum.
Required:

Calculate:
(i) The net present value (NPV); (3 marks)
(ii) The internal rate of return (IRR); (6 marks)
(iii) The discounted payback period, (3 marks)

Of the investment project, using the following information as appropriate:

Year	Cash flow (£000)	Discount Factor (12%)	Discount Factor (20%)
0	(460)	1·000	1·000
1	150	0·893	0·833
2	140	0·797	0·694
3	180	0·712	0·579
4	250	0·636	0·482
5	160	0·567	0·402
6	(40)	0·507	0·335

[Sec: B, Q: 4 T4 Pilot Paper]

2

A company is considering investment in several projects. The following information relates to three of the projects:

Project 1:	Investment of £119,000 at the start of the project.
	Net cash inflow of £13,500 per annum in perpetuity.

Project 2:	Investment of £241,000 at the start of the project.
	Net present value (NPV) at 20% of (£23,000) i.e. negative, based on net cash inflows of:
	1st year £60,000
	2nd year £65,000
	3rd year £70,000
	4th year £100,000
	5th year £85,000

Project 3:	Investment of £186,000 at the start of the project.
	Constant annual net cash inflows for five years.
	Internal rate of return (IRR) of 14%.

Assume that net cash inflows occur at the end of each year.
Discount factors at 10% per annum (the company's cost of capital) and at 14% per annum are:

Year	10%	14%
1	0·909	0·877
2	0·826	0·769
3	0·751	0·675
4	0·683	0·592
5	0·621	0·519
1 to 5	3·790	3·432

Required:
(a) Calculate the net present value (NPV) of Project 1 at the company's cost of capital.   (3 marks)
(b) Calculate the estimated internal rate of return (IRR) of Project 2.   (6 marks)
(c) Calculate the annual net cash inflow of Project 3.   (3 marks)

(d) If the cost of capital increased to 15%, state, with reasons, whether investment in Projects 2 and 3 would be justified. (NB Base your answer on the discounted cash flow analysis already carried out. No further discounted calculations are required.)   (3 marks)

[Sec: B, Q: 4 T4 June 2004]

3(a)

The future value (S) of a sum invested now can be calculated using the formula:

$$S = P (1 + r)^n$$

Required:
(i) Define each of the other constituents in the formula above (i.e. P, r and n);   (3 marks)
(ii) Calculate the value (to the nearest £) after four years of £5,000 invested now at a compound rate of interest of 8% per annum.   (3 marks)

3(b)

A company is considering an investment in new machinery. The incremental annual profits (losses) relating to the investment are estimated to be:

	£'000
Year 1	(11)
Year 2	3
Year 3	34
Year 4	47
Year 5	8

Investment at the start of the project would be £175,000. The investment sum, assuming nil disposal value after five years, would be written off using the straight-line method. The depreciation has been included in the profit estimates above, which should be assumed to arise at each year end.

Required:
(i) Calculate the net present value (NPV) of the investment at a discount rate of 10% per annum (the company's required rate of return);

Discount factors at 10% are:

Year 1	0·909
Year 2	0·826
Year 3	0·751
Year 4	0·683
Year 5	0·621

(8 marks)

(ii) State, on the basis of your calculations, whether the investment is worthwhile. Justify your statement.   (2 marks)

[Sec: B, Q: 1 T4 December 2005]

4

A capital investment project has estimated net cash inflows of £60,000 per annum for six years. Discounting the net cash inflows at 10% and 20% per annum, the present values of the inflows are:

Annual discount rate   Present value of inflows
10%   £261,300
20%   £199,600

The initial investment amount is £224,000.

Required:
(i) Plot the net present values of the project, at discount rates of 10% and 20% per annum, on the graph paper
(6 marks)
(ii) Indicate, on the graph, an estimate of the internal rate of return of the project. (2 marks)
[Sec: B, Q: 1(c) T4 June 2006]

5

A company is considering whether to add a new product to its range. Machinery costing $280,000 would have to be bought at the start of the project (Year 0). The project life would be five years with no disposal value at the end of the project.

Sales of the new product are forecast at 12,000 units in each of Years 1 and 2, rising to 15,000 units in each of Years 3, 4 and 5. The selling price per unit will be $15 in Year 1 and $16 thereafter. Variable costs are estimated at $9 per unit.

Straight-line depreciation of the machine would be $56,000 in each year. No other future incremental fixed costs would be incurred. However, the company has already incurred expenditure of $6,000 for a market research survey and has decided to write this off against profits made in the first year if the investment takes place.

Assume that all cash flows, apart from the investment in machinery, occur at the end of each year.

The cost of capital is 14% per annum. Discount factors at 14% are:
Year 1   0·877
Year 2   0·769
Year 3   0·675
Year 4   0·592
Year 5   0·519

Required:
(a) Calculate the net cash flows for each year of the project (Year 0 to 5). (8 marks)
(b) Calculate the net present value of the project (working in $000). (6 marks)
(c) State whether the internal rate of return is above or below 14% and justify your conclusion. (2 marks)
[Sec: B, Q: 1 T4 December 2008]