Fundamentals Level – Skills Module

Performance Management

Monday 2 June 2014

Time allowed
Reading and planning: 15 minutes
Writing: 3 hours

ALL FIVE questions are compulsory and MUST be attempted.

Formulae Sheet is on page 7.

Do NOT open this paper until instructed by the supervisor.

During reading and planning time only the question paper may be annotated. You must NOT write in your answer booklet until instructed by the supervisor.

This question paper must not be removed from the examination hall.

The Association of Chartered Certified Accountants

Paper F5

ACCA

ALL FIVE questions are compulsory and MUST be attempted

1 Duff Co manufactures three products, X, Y and Z. Demand for products X and Y is relatively elastic whilst demand for product Z is relatively inelastic. Each product uses the same materials and the same type of direct labour but in different quantities. For many years, the company has been using full absorption costing and absorbing overheads on the basis of direct labour hours. Selling prices are then determined using cost plus pricing. This is common within this industry, with most competitors applying a standard mark-up.

Budgeted production and sales volumes for X, Y and Z for the next year are 20,000 units, 16,000 units and 22,000 units respectively.

The budgeted direct costs of the three products are shown below:

Product	X	Y	Z
	$ per unit	$ per unit	$ per unit
Direct materials	25	28	22
Direct labour ($12 per hour)	30	36	24

In the next year, Duff Co also expects to incur indirect production costs of $1,377,400, which are analysed as follows:

Cost pools	$	Cost drivers
Machine set up costs	280,000	Number of batches
Material ordering costs	316,000	Number of purchase orders
Machine running costs	420,000	Number of machine hours
General facility costs	361,400	Number of machine hours
	1,377,400	

The following additional data relate to each product:

Product	X	Y	Z
Batch size (units)	500	800	400
No of purchase orders per batch	4	5	4
Machine hours per unit	1·5	1·25	1·4

Duff Co wants to boost sales revenue in order to increase profits but its capacity to do this is limited because of its use of cost plus pricing and the application of the standard mark-up. The finance director has suggested using activity based costing (ABC) instead of full absorption costing, since this will alter the cost of the products and may therefore enable a different price to be charged.

Required:

(a) Calculate the budgeted full production cost per unit of each product using Duff Co's current method of absorption costing. All workings should be to two decimal places. (3 marks)

(b) Calculate the budgeted full production cost per unit of each product using activity based costing. All workings should be to two decimal places. (11 marks)

(c) Discuss the impact on the selling prices and the sales volumes OF EACH PRODUCT which a change to activity based costing would be expected to bring about. (6 marks)

(20 marks)

2 Tablet Co makes two types of tablet computer, the Xeno (X) and the Yong (Y). X currently generates a contribution of $30 per unit and Y generates a contribution of $40 per unit. There are three main stages of production: the build stage, the program stage and the test stage. Each of these stages requires the use of skilled labour which, due to a huge increase in demand for tablet computers over recent months, is now in short supply. The following information is available for the two products:

Stage	Xeno (X) Minutes per unit	Yong (Y) Minutes per unit
Build ($10 per hour)	24	20
Program ($16 per hour)	16	14
Test ($12 per hour)	10	4

Tablet Co is now preparing its detailed production plans for the next quarter. During this period it expects that the skilled labour available will be 30,000 hours (1,800,000 minutes) for the build stage, 28,000 hours (1,680,000 minutes) for the program stage and 12,000 hours (720,000 minutes) for the test stage. The maximum demand for X and Y over the three-month period is expected to be 85,000 units and 66,000 units respectively. Fixed costs are $650,000 per month.

Due to rapid technological change, the company holds no inventory of finished goods.

Required:

(a) On the graph paper provided, use linear programming to calculate the optimum number of each product which Tablet Co should make in the next quarter assuming it wishes to maximise contribution. Calculate the total profit for the quarter. (14 marks)

(b) Calculate the amount of any slack resources arising as a result of the optimum production plan and explain the implications of these amounts for decision-making within Tablet Co. (6 marks)

(20 marks)

3 The Rotech group comprises two companies, W Co and C Co.

W Co is a trading company with two divisions: The Design division, which designs wind turbines and supplies the designs to customers under licences and the Gearbox division, which manufactures gearboxes for the car industry.

C Co manufactures components for gearboxes. It sells the components globally and also supplies W Co with components for its Gearbox manufacturing division.

The financial results for the two companies for the year ended 31 May 2014 are as follows:

	W Co		C Co
	Design division	Gearbox division	
	$'000	$'000	$'000
External sales	14,300	25,535	8,010
Sales to Gearbox division			7,550
			15,560
Cost of sales	(4,900)	(16,200)*	(5,280)
Administration costs	(3,400)	(4,200)	(2,600)
Distribution costs	–	(1,260)	(670)
Operating profit	6,000	3,875	7,010
Capital employed	23,540	32,320	82,975

* Includes cost of components purchased from C Co.

Required:

(a) Discuss the performance of C Co and each division of W Co, calculating and using the following three performance measures:

(i) Return on capital employed (ROCE)
(ii) Asset turnover
(iii) Operating profit margin

Note: There are 4·5 marks available for calculations and 5·5 marks available for discussion. (10 marks)

(b) C Co is currently working to full capacity. The Rotech group's policy is that group companies and divisions must always make internal sales first before selling outside the group. Similarly, purchases must be made from within the group wherever possible. However, the group divisions and companies are allowed to negotiate their own transfer prices without interference from Head Office.

C Co has always charged the same price to the Gearbox division as it does to its external customers. However, after being offered a 5% lower price for similar components from an external supplier, the manager of the Gearbox division feels strongly that the transfer price is too high and should be reduced. C Co currently satisfies 60% of the external demand for its components. Its variable costs represent 40% of revenue.

Required:

Advise, using suitable calculations, the total transfer price or prices at which the components should be supplied to the Gearbox division from C Co. (10 marks)

(20 marks)

4 Gam Co sells electronic equipment and is about to launch a new product onto the market. It needs to prepare its budget for the coming year and is trying to decide whether to launch the product at a price of $30 or $35 per unit. The following information has been obtained from market research:

Price per unit $30		Price per unit $35	
Probability	Sales volume	Probability	Sales volume
0·4	120,000	0·3	108,000
0·5	110,000	0·3	100,000
0·1	140,000	0·4	94,000

Notes

1 Variable production costs would be $12 per unit for production volumes up to and including 100,000 units each year. However, if production exceeds 100,000 units each year, the variable production cost per unit would fall to $11 for all units produced.

2 Advertising costs would be $900,000 per annum at a selling price of $30 and $970,000 per annum at a price of $35.

3 Fixed production costs would be $450,000 per annum.

Required:

(a) Calculate each of the six possible profit outcomes which could arise for Gam Co in the coming year. (8 marks)

(b) Calculate the expected value of profit for each of the two price options and recommend, on this basis, which option Gam Co would choose. (3 marks)

(c) Briefly explain the maximin decision rule and identify which price should be chosen by management if they use this rule to decide which price should be charged. (3 marks)

(d) Discuss the factors which may give rise to uncertainty when setting budgets. (6 marks)

(20 marks)

5 Valet Co is a car valeting (cleaning) company. It operates in the country of Strappia, which has been badly affected by the global financial crisis. Petrol and food prices have increased substantially in the last year and the average disposable household income has decreased by 30%. Recent studies have shown that the average car owner keeps their car for five years before replacing it, rather than three years as was previously the case. Figures over recent years also show that car sales in Strappia are declining whilst business for car repairs is on the increase.

Valet Co offers two types of valet – a full valet and a mini valet. A full valet is an extensive clean of the vehicle, inside and out; a mini valet is a more basic clean of the vehicle. Until recently, four similar businesses operated in Valet Co's local area, but one of these closed down three months ago after a serious fire on its premises. Valet Co charges customers $50 for each full valet and $30 for each mini valet and this price never changes. Their budget and actual figures for the last year were as follows:

	Budget		Actual	
Number of valets:				
Full valets	3,600		4,000	
Mini valets	2,000		3,980	
	$	$	$	$
Revenue		240,000		319,400
Variable costs:				
Staff wages	(114,000)		(122,000)	
Cleaning materials	(6,200)		(12,400)	
Energy costs	(6,520)		(9,200)	
		(126,720)		(143,600)
Contribution		113,280		175,800
Fixed costs:				
Rent, rates and depreciation		(36,800)		(36,800)
Operating profit		76,480		139,000

The budgeted contribution to sales ratios for the two types of valet are 44·6% for full valets and 55% for mini valets.

Required:

(a) Using the data provided for full valets and mini valets, calculate:

(i) The total sales mix contribution variance; (4 marks)

(ii) The total sales quantity contribution variance. (4 marks)

(b) Briefly describe the sales mix contribution variance and the sales quantity contribution variance. (2 marks)

(c) Discuss the SALES performance of the business for the period, taking into account your calculations from part (a) AND the information provided in the scenario. (10 marks)

(20 marks)

Formulae Sheet

Learning curve

$Y = ax^b$

Where Y = cumulative average time per unit to produce x units
a = the time taken for the first unit of output
x = the cumulative number of units produced
b = the index of learning (log LR/log2)
LR = the learning rate as a decimal

Demand curve

$P = a - bQ$

$$b = \frac{\text{change in price}}{\text{change in quantity}}$$

a = price when Q = 0

$MR = a - 2bQ$

End of Question Paper

Answers

1 (a) **Full budgeted production cost per unit using absorption costing**

Product	X	Y	Z	Total
Budgeted annual production (units)	20,000	16,000	22,000	
Labour hours per unit	2·5	3	2	
Total labour hours	50,000	48,000	44,000	142,000

Overhead absorption rate = $1,377,400/142,000 = $9·70 per hour.

Product	X	Y	Z
	$ per unit	$ per unit	$ per unit
Direct materials	25	28	22
Direct labour	30	36	24
Overhead ($9·70 x 2·5/3/2)	24·25	29·10	19·40
Full cost per unit	79·25	93·10	65·40

(b) **Full budgeted production cost per unit using activity based costing**

Product	X	Y	Z	Total
Budgeted annual production (units)	20,000	16,000	22,000	
Batch size	500	800	400	
Number of batches (i.e. set ups)	**40**	**20**	**55**	**115**
Number of purchase orders per batch	4	5	4	
Total number of orders	**160**	**100**	**220**	**480**
Machine hours per unit	1·5	1·25	1·4	
Total machine hours	**30,000**	**20,000**	**30,800**	**80,800**

Cost driver rates:

Cost per machine set up	$280,000/115 = $2,434·78
Cost per order	$316,000/480 = $658·33
Cost per machine hour	($420,000 + $361,400)/80,800 = $9·67

Allocation of overheads to each product:

Product	X	Y	Z	Total
	$	$	$	
Machine set up costs	97,391	48,696	133,913	280,000
Material ordering costs	105,333	65,833	144,834	316,000
Machine running and facility costs	290,100	193,400	297,836	781,336*
Total	492,824	307,929	576,583	1,377,336
Number of units produced	20,000	16,000	22,000	
Overhead cost per unit	$24·64	$19·25	$26·21	
Total cost per unit:	**$ per unit**	**$ per unit**	**$ per unit**	
Direct materials	25	28	22	
Direct labour	30	36	24	
Overhead	24·64	19·25	26·21	
ABC cost per unit	79·64	83·25	72·21	

*A difference of $64 arises here as compared to the cost pool total of $781,400 because of rounding differences. This has been ignored.

(c) When activity based costing is used, the cost for product X is very similar to that cost calculated using full absorption costing. This means that the price for product X is likely to remain unchanged because cost plus pricing is being used. Demand for product X is relatively elastic but since no change in price is expected, sales volumes are likely to remain the same if ABC is introduced.

However, the cost for product Y is almost $10 per unit less using ABC. This means that the price of product Y will go down if cost plus pricing is used. Given that demand for product Y is also elastic, like demand for product X, a reduced selling price is likely to give rise to increased sales volumes.

The cost of product Z is nearly $7 per unit more using ABC and the price of product Z will therefore go up if ABC is used. Given that demand for product Z is relatively inelastic, this means that sales volumes would be expected to be largely unchanged despite an increase in price.

2 (a) Optimum production plan

Define the variables
Let x = number of units of Xeno to be produced.
Let y = number of units of Yong to be produced.
Let C = contribution.

State the objective function
$C = 30x + 40y$

State the constraints
Build time: $24x + 20y \leq 1{,}800{,}000$
Program time: $16x + 14y \leq 1{,}680{,}000$
Test time: $10x + 4y \leq 720{,}000$

Non-negativity constraints:
$x, y \geq 0$

Sales constraints
$x \leq 85{,}000$
$y \leq 66{,}000$

Draw the graph

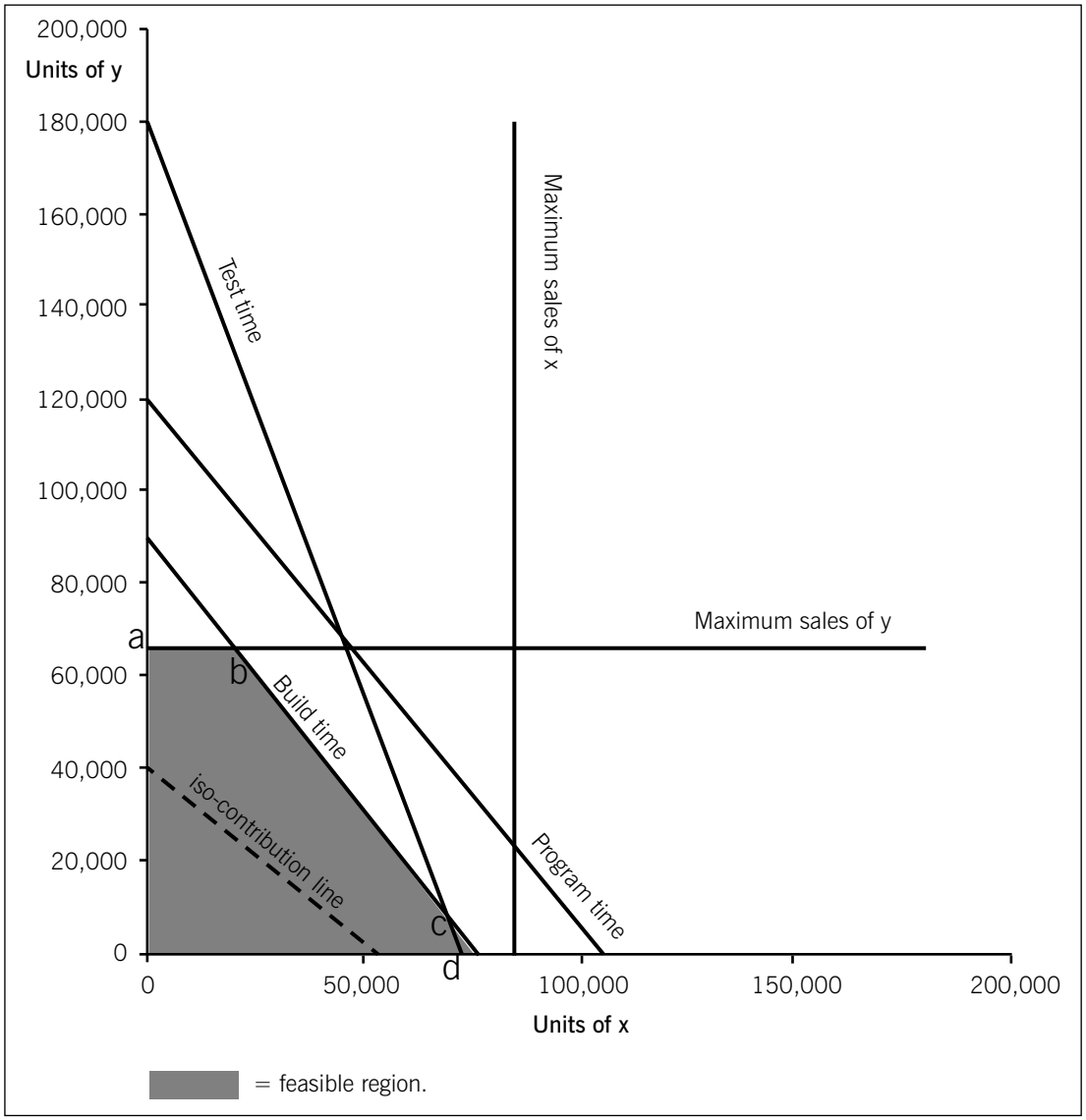
Build time:
If $x = 0$, $y = 1{,}800{,}000/20 = 90{,}000$
If $y = 0$, $x = 1{,}800{,}000/24 = 75{,}000$

Program time:
If $x = 0$, $y = 1{,}680{,}000/14 = 120{,}000$
If $y = 0$, $x = 1{,}680{,}000/16 = 105{,}000$

Test time:
If $x = 0$, $y = 720{,}000/4 = 180{,}000$
If $x = 0$, $y = 720{,}000/10 = 72{,}000$

Solve using the iso-contribution line

If $y = 40{,}000$, $C = 40{,}000 \times \$40 = \$1{,}600{,}000$
If $C = \$1{,}600{,}000$ and $y = 0$, $x = \$1{,}600{,}000/\$30 = 53{,}333{\cdot}33$



Moving the iso-contribution line out to the furthest point on the feasible region, the optimum production point is b. This is the intersection of the build time constraint and the sales constraint for y. Solving the simultaneous equations for these two constraints:

y = 66,000
24x + 20y = 1,800,000
24x + (20 x 66,000) = 1,800,000
24x + 1,320,000 = 1,800,000
24x = 480,000
x = 20,000

C = (20,000 x $30) + (66,000 x $40)
= $600,000 + $2,640,000 = $3,240,000

Fixed costs = 3 x $650,000 = $1,950,000.
Therefore profit = $1,290,000.

(b) Slack resources

Test time used = (20,000 x 10)/60 + (66,000 x 4)/60 = 7,733 hours.
Therefore slack hours = 12,000 – 7,733= 4,267 hours.

Program time used = (20,000 x 16)/60 + (66,000 x 14)/60 = 20,733 hours.
Therefore slack hours = 28,000 – 20,733 = 7,267 hours.

The slack values for test time and program time mean that there are 4,267 and 7,267 hours of each respective department's time unutilised under the optimum production plan. If possible, this time could be used by the organisation elsewhere or subcontracted out to another company.

3 (a) Ratios

(i) ROCE = operating profit/capital employed x 100%

		$'000	ROCE
W Co	Design division	6,000/23,540	25·49%
	Gearbox division	3,875/32,320	11·99%
C Co		7,010/82,975	8·45%

(ii) Asset turnover = sales/capital employed x 100%

		$'000	Asset turnover
W Co	Design division	14,300/23,540	0·61
	Gearbox division	25,535/32,320	0·79
C Co		15,560/82,975	0·19

(iii) Operating profit margin = operating profit/sales x 100%

		$'000	Operating profit
W Co	Design division	6,000/14,300	41·96%
	Gearbox division	3,875/25,535	15·18%
C Co		7,010/15,560	45·05%

Both companies and both divisions within W Co are clearly profitable. In terms of what the different ratios tell us, ROCE tells us the return which a company is making from its capital. The Design division of W Co is making the highest return at over 25%, more than twice that of the Gearbox division and nearly three times that of C Co. This is because the nature of a design business is such that profits are largely derived from the people making the designs rather than from the assets. Certain assets will obviously be necessary in order to produce the designs but it is the employees who are mostly responsible for generating profit.

The Gearbox division and C Co's ROCE are fairly similar compared to the Design division, although when comparing the two in isolation, the Gearbox division's ROCE is actually over three percentage points higher than C Co's (11·99% compared to 8·45%). This is because C Co has a substantially larger asset base than the Gearbox division.

From the asset turnover ratio, it can be seen that the Gearbox division's assets generate a very high proportion of sales per $ of assets (79%) compared to C Co (19%). This is partly because the Gearbox division buys its components in from C Co and therefore does not need to have the large asset base which C Co has in order to make the components. When the unit profitability of those sales is considered by looking at the operating profit margin, C Co's unit profitability is much higher than the Gearbox division (45% operating profit margin as compared to 15%). The Design division, like the Gearbox division, is also using its assets well to generate sales (asset turnover of 61%) but then, like C Co, its unit profitability is high too (42% operating profit margin.) This is why, when the two ratios (operating profit margin and asset turnover) are combined to make ROCE, the Design division comes out top overall – because it has both high unit profitability and generates sales at a high level compared to its asset base.

(b) Transfer prices

From C Co's perspective

C Co transfers components to the Gearbox division at the same price as it sells components to the external market. However, if C Co were not making internal sales then, given that it already satisfies 60% of external demand, it would not be able to sell all of its current production to the external market. External sales are $8,010,000, therefore unsatisfied external demand is ([$8,010,000/0·6] – $8,010,000) = $5,340,000.

From C Co's perspective, of the current internal sales of $7,550,000, $5,340,000 could be sold externally if they were not sold to the Gearbox division. Therefore, in order for C Co not to be any worse off from selling internally, these sales should be made at the current price of $5,340,000, less any reduction in costs which C Co saves from not having to sell outside the group (perhaps lower administrative and distribution costs).

As regards the remaining internal sales of $2,210,000 ($7,550,000 – $5,340,000), C Co effectively has spare capacity to meet these sales. Therefore, the minimum transfer price should be the marginal cost of producing these goods. Given that variable costs represent 40% of revenue, this means that the marginal cost for these sales is $884,000. This is therefore the minimum price which C Co should charge for these sales.

In total, therefore, C Co will want to charge at least $6,224,000 for its sales to the Gearbox division.

From the Gearbox division's perspective

The Gearbox division will not want to pay more for the components than it could purchase them for externally. Given that it can purchase them all for 95% of the current price, this means a maximum purchase price of $7,172,500.

Overall

Taking into account all of the above, the transfer price for the sales should be somewhere between $6,224,000 and $7,172,500.

4 (a) Profit outcomes

Unit contribution	Sales price per unit	
	$30	$35
Up to 100,000 units	$18	$23
Above 100,000 units	$19	$24

Sales price $30

Sales volume	Unit contribution	Total contribution	Fixed costs	Advertising costs	Profit
	$	$'000	$'000	$'000	$'000
120,000	19	2,280	450	900	930
110,000	19	2,090	450	900	740
140,000	19	2,660	450	900	1,310

Sales price $35

Sales volume	Unit contribution	Total contribution	Fixed costs	Advertising costs	Profit
	$	$'000	$'000	$'000	$'000
108,000	24	2,592	450	970	1,172
100,000	23	2,300	450	970	880
94,000	23	2,162	450	970	742

(b) Expected values

Sales price $30

Sales volume	Profit	Probability	EV of profit
	$'000		$'000
120,000	930	0·4	372
110,000	740	0·5	370
140,000	1,310	0·1	131
			873

Sales price $35

Sales volume	Profit	Probability	EV of profit
	$'000		$'000
108,000	1,172	0·3	351·6
100,000	880	0·3	264
94,000	742	0·4	296·8
			912·4

If the criterion of expected value is used to make a decision as to which price to charge, then the price charged should be $35 per unit since the expected value of this option is the greatest.

(c) Maximin decision rule

Under this rule, the decision-maker selects the alternative which offers the most attractive worst outcome, i.e. the alternative which maximises the minimum profit. In the case of Gam Co, this would be the price of $35 as the lowest profit here is $742,000 as compared to a lowest profit of $740,000 at a price of $30.

(d) Reasons for uncertainty arising in the budgeting process

Uncertainty arises largely because of changes in the external environment over which a company will sometimes have little control. Reasons include:

- Customers may decide to buy more or less goods or services than originally forecast. For example, if a major customer goes into liquidation, this has a huge effect on a company and could also cause them to go into liquidation.
- Competitors may strengthen or emerge and take some business away from a company. On the other hand, a competitor's position may weaken leading to increased business for a particular company.
- Technological advances may take place which lead a company's products or services to become out-dated and therefore less desirable.
- The workforce may not perform as well as expected, perhaps because of time off due to illness or maybe simply because of lack of motivation.
- Materials may increase in price because of global changes in commodity prices.
- Inflation can cause the price of all inputs to increase or decrease.

– If a company imports or exports goods or services, changes in exchange rates can cause prices to change.
– Machines may fail to meet production schedules because of breakdown.
– Social/political arrest could affect productivity, e.g. the workforce goes on strike.

Note: *This list is not exhaustive, nor would candidates be expected to make all the points raised in order to score full marks.*

5 (a) Variances

(i) The sales mix contribution variance

Calculated as (actual sales quantity – actual sales quantity in budgeted proportions) x standard contribution per unit.

Standard contributions per valet:
Full = $50 x 44·6% = $22·30 per valet
Mini = $30 x 55% = $16·50 per valet
Actual sales quantity in budgeted proportions (ASQBP):
Full: 7,980 x (3,600/5,600) = 5,130
Mini: 7,980 x (2,000/5,600) = 2,850

Valet type	ASQ	ASQBP	Difference	Standard contribution	Variance
				$	$
Full	4,000	5,130	(1,130)	22·30	25,199 A
Mini	3,980	2,850	1,130	16·50	18,645 F
					6,554 A

(ii) The sales quantity contribution variance

Calculated as (actual sales quantity in budgeted proportions – budgeted sales quantity) x standard contribution per unit.

Valet type	ASQBP	BQ	Difference	Standard contribution	Variance
				$	$
Full	5,130	3,600	1,530	22·30	34,119 F
Mini	2,850	2,000	850	16·50	14,025 F
					48,144 F

(b) Description

The sales mix contribution variance
This variance measures the effect on profit of changing the mix of actual sales from the standard mix.

The sales quantity contribution variance
This variance measures the effect on profit of selling a different total quantity from the budgeted total quantity.

(c) Sales performance of the business

The sales performance of the business has been very good over the last year, as shown by the favourable sales quantity variance of $48,144. Overall, total sales revenue is 33% higher than budgeted (($319,400 – $240,000)/$240,000). This is because of an increase in the total number of valets which have been performed. When you look at where the increase in sales quantity has actually taken place, you can see from the data provided in the question that it is the number of mini valets which has increased dramatically. This number has increased by 99% ((3,980 – 2,000)/2,000) whereas the number of full valets has only increased by 11% ((4,000 – 3,600)/3,600). Even 11% is still positive, however.

The fact that the mini valets increased so dramatically in number combined with the fact that they generate a lower contribution per unit than the full valet led to an adverse sales mix variance of $6,554 in the year. This cannot be looked at in isolation as a sign of poor performance; it is simply reflective of the changes which have occurred in Strappia. We are told that disposable incomes in Strappia have decreased by 30% over the last year. This means that people have less money to spend on non-essential expenditure such as car valeting. Consequently, they are opting for the cheaper mini valet rather than the more expensive full valet. At the same time, we are also told that people are keeping their cars for an average of five years now as opposed to three years. This may be leading them to take more care of them and get them valeted regularly because they know that the car has to be kept for a longer period. Thus, the total quantity of valets has increased, particularly the mini valets.

Also, there is now one less competitor for Valet Co than there was a year ago, so Valet Co may have gained some of the old competitor's business. Together, all of these factors would explain the increase in the total number of valets performed and in particular, an increase in the less expensive valet.

Note: *Other valid points will be given full credit.*

			Marks
1	**(a)**	**Full absorption cost**	
		Overhead absorption rate	1·5
		Cost for X incl labour and materials	0·5
		Cost for Y incl labour and materials	0·5
		Cost for Z incl labour and materials	0·5
			3
	(b)	**Activity based cost**	
		Correct cost driver rates	4·5
		Overhead unit cost for X	1
		Overhead unit cost for Y	1
		Overhead unit cost for Z	1
		Adding labour and materials costs	2
		Total cost for X	0·5
		Total cost for Y	0·5
		Total cost for Z	0·5
			11
	(c)	**Discussion**	
		Per valid point on each product	2
			6
		Total marks	**20**
2	**(a)**	**Optimum production plan**	
		Stating the objective function	0·5
		Defining constraint for built time	0·5
		Defining constraint for program time	0·5
		Defining constraint for test time	0·5
		Non-negativity constraints	0·5
		Sales constraint x	0·5
		Sales constraint y	0·5
		Iso-contribution line worked out	1
		The graph:	
		Labels	0·5
		Build time line	0·5
		Program time line	0·5
		Test time line	0·5
		Demand for x line	0·5
		Demand for y line	0·5
		Iso-contribution line	0·5
		Vertices a–d identified	0·5
		Feasible region shaded	0·5
		Optimum point identified	1
		Equations solved at optimum point	3
		Total contribution	0·5
		Total profit	0·5
			14
	(b)	**Slack values**	
		Test time calculation	1·5
		Program time calculation	1·5
		Test time explanation	1·5
		Program time explanation	1·5
			6
		Total marks	**20**

			Marks
3	**(a)**	**Ratios**	
		Calculating ROCE	1·5
		Calculating asset turnover	1·5
		Calculating operating profit margin	1·5
		Stating asset turnover and profit margin drive ROCE	1·5
		Per other valid comment	1
			10
	(b)	**Transfer pricing**	
		Each valid comment/calculation	1 or 2
			10
		Total marks	**20**
4	**(a)**	**Profit outcomes**	
		Unit contribution up to 100,000 units	1
		Unit contribution above 100,000 units	1
		Each line of table for price of $30 (3 in total)	1
		Each line of table for price of $35 (3 in total)	1
			8
	(b)	**Expected values**	
		Expected value for $30	1
		Expected value for $35	1
		Recommendation	1
			3
	(c)	**Maximin**	
		Explanation	2
		Decision	1
			3
	(d)	**Uncertainty**	
		Each point made	1
			6
		Total marks	**20**
5	**(a)**	**Calculations**	
		Sales mix contribution variance	4
		Sales quantity contribution variance	4
			8
	(b)	**Description**	
		One mark per description	2
	(c)	**Discussion on sales performance**	
		Calculations – each one, max 1·5	0·5
		Maximum for each point made	2
			10
		Total marks	**20**