Answers

1 Hair Co

(a) Weighted average contribution to sales ratio (WA C/S ratio) = total contribution/total sales revenue.

Per unit:	C	S	D
	$	$	$
Selling price	110	160	120
Material 1	(12)	(28)	(16)
Material 2	(8)	(22)	(26)
Skilled labour	(16)	(34)	(22)
Unskilled labour	(14)	(20)	(28)
Contribution	60	56	28
Sales units	20,000	22,000	26,000
Total sales revenue	$2,200,000	$3,520,000	$3,120,000
Total contribution	$1,200,000	$1,232,000	$728,000

WA C/S ratio = $1,200,000 + $1,232,000 + $728,000/$2,200,000 + $3,520,000 + $3,120,000
= $3,160,000/$8,840,000 = 35·75%

(b) Break-even sales revenue = fixed costs/C/S ratio

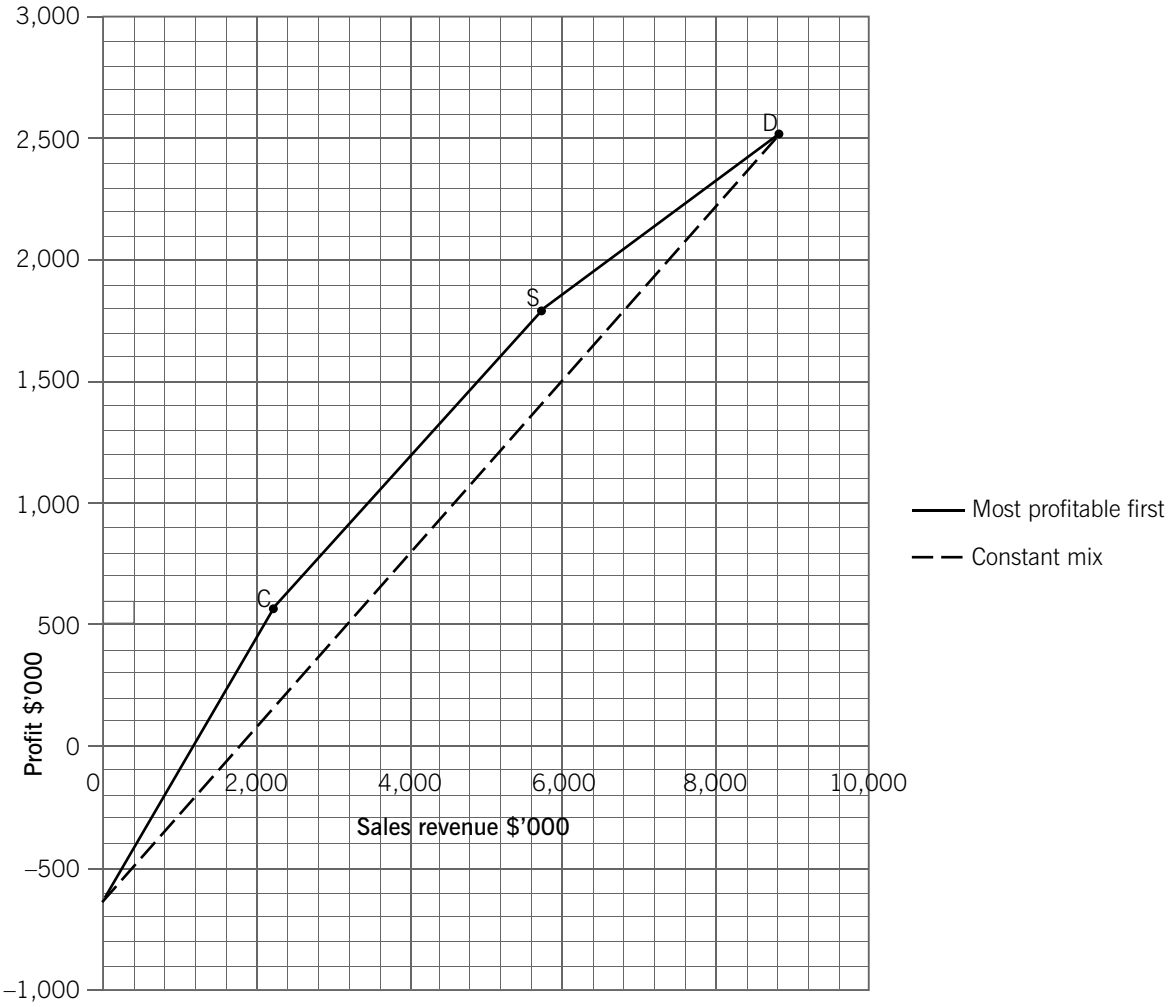
Therefore break-even sales revenue = $640,000/35·75% = $1,790,209·70.

(c) **PV chart**

Calculate the individual C/S ratio for each product then rank them according to the highest one first.

Per unit:	C	S	D
	$	$	$
Contribution	60	56	28
Selling price	110	160	120
C/S ratio	0·55	0·35	0·23
Ranking	1	2	3

Product	Revenue	Cumulative Revenue (x axis co-ordinate)	Profit	Cumulative Profit (y axis co-ordinate)
	$	$	$	$
0	0	0	(640,000)	(640,000)
Make C	2,200,000	2,200,000	1,200,000	560,000
Make S	3,520,000	5,720,000	1,232,000	1,792,000
Make D	3,120,000	8,840,000	728,000	2,520,000



(d) From the chart above it can be seen that, if the products are sold in order of the highest ranking first, break even will take place at a point just under $1,200,000 of sales revenue. The exact figure can be worked out by taking the fixed costs of $640,000 and dividing them by Product C's C/S ratio of 0·55, i.e. the exact BEP is $1,163,636. This is substantially earlier than the break-even point which occurs if the products are all sold in a constant mix, which is $1,790,209, as calculated in (b) above.

The reason for this is obviously because the more profitable product, C, contributes more per unit to fixed costs when being sold on its own, than when a mix of products C, S and D are sold. The weighted average C/S ratio of all three products is only 35·75%, compared to C's C/S ratio of 55%. Obviously, then, break even will occur earlier if C is sold in priority.

In reality, however, the mix of sales will vary throughout the year and Hair Co can neither assume that the products are sold in a constant mix, nor that the most profitable can be sold first.

2 Truffle Co

(a) Basic variances

Standard cost of labour per hour = $6/0·5 = $12 per hour.

Labour rate variance = (actual hours paid x actual rate) – (actual hours paid x std rate)
Actual hours paid x std rate = $136,800/·95 = $144,000.
Therefore rate variance = $144,000 – $136,800 = $7,200 F

Labour efficiency variance = (actual production in std hours – actual hours worked) x std rate
[(20,500 x 0·5) – 12,000] x $12 = $21,000 A.

(b) Planning and operational variances

Labour rate planning variance
(Revised rate – std rate) x actual hours paid = [$12 – ($12 x 0·95)] x 12,000 = $7,200 F.

Labour rate operational variance
There is no labour rate operational variance.
(Revised rate – actual rate) x actual hours paid = $11·40 – $11·40 x 12,000 = 0

Labour efficiency planning variance
(Standard hours for actual production – revised hours for actual production) x std rate
[10,250 – (20,500 x 0·5 x 1·2)] x $12 = $24,600 A.

Labour efficiency operational variance
(Revised hours for actual production – actual hours for actual production) x std rate
(12,300 – 12,000) x $12 = $3,600 F.

(c) Discussion

When looking at the total variances alone, it looks like the production manager has been extremely poor at controlling his staff's efficiency, since the labour efficiency variance is $21,000 adverse. It also looks, at a glance, like he has managed to secure labour at a lower rate.

In order to assess the production manager's performance fairly, however, only the operational variances should be taken into account. This is because planning variances reflect differences that arise because of factors that are outside the control of the production manager. The operational variance for the labour rate was $0, which means that the labour force were paid exactly what was agreed at the end of October: their reduced rate of $11·40 per hour. The manager clearly did not have to pay anyone for overtime, for example, which would have been expected to push this rate up. The rate reduction was secured by the company and was not within the control of the production manager, so he cannot take credit for the favourable rate planning variance of $7,200. The company is the source of this improvement.

As regards labour efficiency, the planning and operational variances give us more information about the total efficiency variance of $21,000A. When this is broken down into its two parts, it becomes clear that the operational variance, for which the manager does have control, is actually $3,600 favourable. This is because, when the recipe is changed as it has been in November, the chocolates usually take 20% longer to make in the first month whilst the workers are getting used to handling the new ingredient mix. When this is taken into account, it can therefore be seen that workers took less than the 20% extra time that they were expected to take, hence the positive operational variance. The planning variance, on the other hand, is $24,600 adverse. This is because the standard labour time per batch was not updated in November to reflect the fact that it would take longer to produce the truffles. The manager cannot be held responsible for this.

Overall, then, the manager has performed well, given the change in the recipe.

3 Web Co

Web Co has made three changes and introduced two incentives in an attempt to increase sales. Using the performance indicators given in the question, it is possible to assess whether these attempts have been successful.

Total sales revenue
This has increased from $2·2 million to $2·75m, an increase of 25% (W1). This is a substantial increase, especially considering the fact that a $10 discount has been given to all customers spending $100 or more at any one time. However, because a number of changes and incentives have been introduced, it is not possible to assess how effective each of the individual changes/incentives has been in increasing sales revenue without considering the other performance indicators.

Net profit margin (NPM)
This has decreased from 25% to 16·7%. In $ terms this means that net profit was $550,000 in quarter 1 and $459,250 in quarter 2 (W2). If the 25% NPM had been maintained in quarter 2, the net profit would have been $687,500 for quarter 2. It is therefore $228,250 lower than it would have been. This is mainly because of the $200,000 paid out for advertising and the $20,000 paid to the consultant for the search engine work. The remaining $8,250 difference could be a result of the cost of the $10 discounts given to customers who spent more than $100, depending on how these are accounted for. Alternatively, it could be due to the costs of providing the Fast Track service. More information would be required on how the discounts are accounted for (whether they are netted off sales revenue or instead included in cost of sales) and also on the cost of providing the Fast Track service.

Whilst it is not clear how long the advert is going to run for in the fashion magazine, $200,000 does seem to be a very large cost. This expense is largely responsible for the fall in NPM. This is discussed further under 'number of visits to website'.

Number of visits to website
These have increased dramatically from 101,589 to 141,714, an increase of 40,125 visits (39·5% W3). The reason for this is a combination of visitors coming through the fashion magazine's website (28,201 visitors W5), with the remainder of the increase most probably being due to the search engine consultants' work. Both of these changes can therefore be said to have been effective in improving the number of people who at least visit Web Co's online store. However, given that the search engine consultant only charged a fee of $20,000 compared to the $200,000 paid for magazine advertising, in relative terms, the consultant's work provided value for money. Web Co's sales are not really high enough to withstand a hit of $200,000 against profit, hence the fall in NPM.

Number of orders/customers spending more than $100
The number of orders received from customers has increased from 40,636 to 49,600, an increase of 22% (W4). This shows that, whilst most of the 25% sales revenue increase is due to a higher number of orders, 3% of it is due to orders being of a higher purchase value. This is also reflected in the fact that the number of customers spending more than $100 per visit has increased

from 4,650 to 6,390, an increase of 1,740 orders. So, for example, If each of these 1,740 customers spent exactly $100 rather than the $50 they might normally spend, it would easily explain the 3% increase in sales that is not due to increased order numbers. It depends partly on how the sales discounts of $10 each are accounted for. As stated above, further information is required on these.

An increase in the number of orders would also be expected, given that the number of visitors to the site has increased substantially. This leads on to the next point.

Conversion rate – visitor to purchaser
The conversion rate of visitors to purchasers has gone down from 40% to 35%. This is not surprising, given the advertising on the fashion magazine's website. Readers of the magazine may well have clicked on the link out of curiosity and may come back and purchase something at a later date. It may be useful to have a breakdown of the visitor to purchaser rate, showing one statistic for visitors who have come from the online magazine and one for those who have not. This would help clarify the position.

Website availability
Rather than improving after the work completed by Web Co's IT department, the website's availability has stayed the same. This means that the IT department's changes to the website have not corrected the problem. Lack of availability is not good for business, although its exact impact is difficult to ascertain. It may be that visitors have been part of the way through making a purchase only to find that the website then becomes unavailable. More information would need to be available about aborted purchases, for example, before any further conclusions could be drawn.

Subscribers to online newsletter
These have increased by a massive 159%. It is not clear what impact this has had on the business as we do not know whether the level of repeat customers has increased. This information is needed. Surprisingly, it seems that there has not been an increased cost associated with providing Fast Track delivery, as the whole fall in net profit has been accounted for, so one can only assume that Web Co managed to offer this service without incurring any additional cost itself.

Conclusion
With the exception of the work carried out to make the system more available, all of the other measures seem to have increased sales or, in the case of Incentive 1, increased subscribers. More information is needed in relation to a couple of areas, as noted above. The business has therefore been responsive to changes made and incentives implemented but the cost of the advertising was so high that, overall, profits have declined substantially. This expenditure seems too high in relation to the corresponding increase in sales volumes.

Workings
1. Increase in sales revenue $2·75m – $2·2m/$2·2m = 25% increase.
2. NPM: 25% x $2·2m = $550,000 profit in quarter 1. 16·7% x $2·75m = $459,250 profit in quarter 2.
3. No. of visits to website: increase = 141,714 – 101,589/101,589 = 39·5%.
4. Increase in orders = 49,600 – 40,636/40,636 = 22%.
5. Customers accessing website through magazine line = 141,714 x 19·9% = 28,201.
6. Increase in subscribers to newsletter = 11,900 – 4,600/4,600 = 159%.

4 Designit

(a) Explanation
The rolling budget outlined for Designit would be a budget covering a 12-month period and would be updated monthly. However, instead of the 12-month period remaining static, it would always roll forward by one month. This means that, as soon as one month has elapsed, a budget is prepared for the corresponding month one year later. For example, Designit would begin by preparing a budget for the 12 months from 1 December 2012 to 30 November 2013, to correspond with its year end. Then, at the end of December 2012, a budget would be prepared for the month December 2013, so that the unexpired period covered by the budget is always 12 months.

When the budget is initially prepared for the year ending 30 November 2013, the first month is prepared in detail, with much less detail being given to later months, where there is a greater uncertainty about the future. Then, when this first month has elapsed and the budget for the month of December 2013 is prepared, it is also necessary to revisit and revise the budget for January 2013, which will now be done in more detail.

Note: *This answer gives more level of detail than would be required to gain full marks.*

(b) Problems
Designit only has one part-qualified accountant. He is already overworked and probably has neither the time nor the experience to prepare rolling budgets every month. One would only expect to see monthly rolling budgets of this nature in businesses which face rapid change. There is no evidence that this is the case for Designit. If it did decide to introduce rolling budgets, it would probably be sufficient if they were updated on a quarterly rather than a monthly basis. If this monthly rolling budget is going to be introduced, it is going to require a lot of input from many of the staff, meaning that they will have less time to dedicate to other things.

The sales managers may react badly to the new budgeting and incentive system. They are used to having been set targets that are easily achievable. With the new system, they will have to work hard all year round. They are also likely to become frustrated with the fact that they do not know the target for the whole year in advance. Once they have hit their target for the

month, they may then also be tempted to hold back further work and let it run into the next month, so that they increase the chances of meeting next month's target. This would not be good for the business.

(c) Alternative incentive scheme

The issue with the current bonus scheme is that the reward system is stepped, rather than being a percentage of sales. The first $1·5 million fee income target is too easy to reach and the second $1·5 million target is too hard to reach. Therefore, managers are not motivated to earn additional fees once the initial $1·5 million target has been reached.

A series of constantly rising bonus rates ranging over a narrower rate of sales could be used. For example, every $500,000 of fee income could be rewarded with an additional bonus equivalent to 5% of salary. Alternatively, the bonus could be replaced by commission, giving the managers a reward as a percentage of the fee income rather than a percentage of salary. Currently, the company is paying out $30,000 in bonus to each of its managers each year. This is 2% of $1·5 million. Therefore, the bonus could be that each manager earns 2% commission on all sales.

(d) Using spreadsheets

If spreadsheets are used for budgeting, the part-qualified accountant could be rekeying large amounts of data taken from the company's systems. It would be very easy for him to make a mistake when he is entering his data, especially without someone else to check his work.

Similarly, if there is any error in any of the formulae, all the numbers in the budget will be wrong. Whilst this risk already exists because fixed budgets are being prepared on spreadsheets, the rolling budgets will be far more complex, which increases the risk of error in the design of the model or any of the formulae.

A model can become easily corrupted simply by putting a number in the wrong cell. The accountant is unlikely to spot this due to his lack of experience and the time pressure on him.

When spreadsheets are used, there is no audit trail that can be followed in order to check the numbers.

5 Wash Co

(a) Transfer price using machine hours

Total overhead costs = $877,620
Total machine hours = (3,200 x 2) + (5,450) x 1 = 11,850
Overhead absorption rate = $877,620/11,850 = $74·06
Overhead cost for S = 2 x $74·06 = $148·12 and for R = 1 x $74·06 = $74·06.

	Product S	Product R
	$	$
Materials cost	117	95
Labour cost (at $12 per hour)	6	9
Overhead costs	148·12	74·06
Total cost	271·12	178·06
10% mark-up	27·11	17·81
Transfer price using machine hours	298·23	195·87

(b) Transfer price using ABC

Machine set up costs: driver = number of production runs.
30 + 12 = 42.
Therefore cost per set up = $306,435/42 = $7,296·07

Machine maintenance costs: driver = machine hours: 11,850 (S= 6,400; R=5,450)
$415,105/11,850 = $35·03

Ordering costs: driver = number of purchase orders
82 + 64 = 146.
Therefore cost per order = $11,680/146 = $80
Delivery costs: driver = number of deliveries.
64 + 80 = 144.
Therefore cost per delivery = $144,400/144 = $1,002·78

Allocation of overheads to each product:

	Product S	Product R	Total
	$	$	$
Machine set-up costs	218,882	87,553	306,435
Machine maintenance costs	224,192	190,913	415,106
Ordering costs	6,560	5,120	11,680
Delivery costs	64,178	80,222	144,400
Total overheads allocated	513,812	363,808	877,620
Number of units produced	3,200	5,450	8,650
	$	$	
Overhead cost per unit	160·57	66·75	
Transfer price per unit:			
Materials cost	117	95	
Labour cost	6	9	
Overhead costs	160·57	66·75	
Total cost	283·57	170·75	
Add 10% mark up	28·36	17·08	
Transfer price under ABC	311·93	187·83	

(c) (i) ABC monthly profit

Using ABC transfer price from part (b):

Assembly division	**Product S**	**Product R**	**Total**
Production and sales	3,200	5,450	
	$	$	
10% mark up	28·36	17·08	
Profit	90,752	93,086	183,838

Retail division	**Product S**	**Product R**	**Total**
Production and sales	3,200	5,450	
	$	$	
Selling price	320	260	
Cost price	(311·93)	(187·83)	
Profit per unit	8·07	72·17	
Total profit	25,824	393,327	419,151

(ii) Discussion

From the various profit figures for the three bases of allocating overheads, various observations can be made.

- There is obviously very little difference between the TOTAL profits of each division whichever method is used, except for differences arising from rounding. In each case, the total profit made by the assembly division is approximately $183,000 and $419,000 for the retail division. It is the reallocation of profits from R to S or S to R that is the important factor in this situation, given that the retail division wants to reduce prices but increase sales volumes for R.
- As regards the assembly division, when labour hours are used to allocate overheads, there is a big difference between the profits that each of the two products makes. When machine hours or ABC are used, this difference becomes much smaller.
- As regards the retail division, when labour hours are used, product S generates 76% of the profit. When this method of allocation is then changed so that either machine hours are used or ABC is used, the main share of the profit then moves to product R. In the case of ABC, the profit moves so much to R that S only generates a profit per unit of $8·07 for the retail division, which is very low for a selling price of $320.
- From the assembly division manager's point of view, any change that results in increased sales of either R or S to the retail division would be a good thing for the assembly division, given that both products are profitable. However, the assembly division's manager would probably oppose the implementation of ABC to achieve this end result because firstly, it is complex and secondly, it is unnecessary here. The aim of this exercise is to set more accurate transfer prices for R and S, which should mean a reduction in R's transfer price and an increase in S's, according to the information given. This would then have the effect of enabling the retail division to lower its price for R and increase sales volumes. This goal is achieved simply by changing the basis of overhead absorption from labour hours to machine hours, without the need for activity based costing.

– The retail manager's view is likely to be exactly the same. If the basis of absorption is changed so that a lower transfer price is charged, the retail division could potentially reduce their selling price for R, provided that the increased sales volumes more than make up for the reduced margin. There is no need to get into the complexities of ABC when the results it produces are not that different.

Marks

1 Hair Co

(a)	Weighted average C/S ratio	
	Individual contributions	3
	Total sales revenue	1
	Total contribution	1
	Ratio	1
		6
(b)	Break-even revenue	2
(c)	PV chart	
	Individual CS ratios	1·5
	Ranking	1
	Workings for chart	2
	Chart:	
	Labelling	0·5
	Plotting each of six points	4
		9
(d)	Discussion	
	General comments re assumptions of CVP (max. 2 marks)	1
	Each valid point re BEP	1
		3
	Total	**20**

2 Truffle Co

(a)	Rate and efficiency variances	
	Rate variance	2
	Efficiency variance	2
		4
(b)	Planning and operational variances	
	Labour rate planning variance	2
	Labour rate operational variance	2
	Labour efficiency planning variance	2
	Labour efficiency operational variance	2
		8
(c)	Discussion	
	Only operational variances controllable	1
	No labour rate operating variance	1
	Planning variance down to company, not manager	2
	Labour efficiency total variance looks bad	2
	Manager has performed well as regards efficiency	2
	Standard for labour time was to blame	2
	Conclusion	2
	Maximum marks	8
	Total	**20**

		Marks
3	**Web Co**	
	Calculations	4
	Missing info	3
	Discussion and further analysis (2–3 marks per point)	18
	Conclusion	2
	Total	**20**
4	**Designit**	
(a)	Explanation	
	Updated after one month elapsed	1
	Always 12 months	1
	Example given	1
	First month in detail	1
	Later month less detail	1
	Need to revisit earlier months	1
	Maximum	4
(b)	Problems	
	More time	1
	Lack of experience	1
	Too regular	2
	Managers' resistance	2
	Work harder	1
	Holding back work	2
	Maximum	6
(c)	Simpler incentive scheme	
	Current target too easy	1
	Second target too hard	1
	Other valid point re current scheme	1
	New scheme outlined	3
		6
(d)	Using spreadsheets	
	Errors entering data	1
	Rolling budgets more complex	1
	Formulae may be wrong	1
	Corruption of model	1
	No audit trail	1
	Maximum	4
	Total	**20**

		Marks
5	**Wash Co**	
(a)	Transfer price using machine hours	
	Calculating OAR	1
	New TP for S	1
	New TP for R	1
		3
(b)	Transfer price using ABC	
	Identify cost drivers	1
	Cost driver rates	2
	Total overheads allocated	2
	Overhead cost per unit	1
	Total cost per unit	1
	Transfer price per unit	1
		8
(c)	ABC profit and discussion	
(i)	Profit calculation	3
(ii)	Each valid comment	2
	Maximum marks	6
	Total	**20**