
Answers

1 (a) Standard costing variances

Direct material

Actual usage at actual cost	16,000m x £1.40	=	£22,400	
		Price	>	£1,600 Fav
Actual usage at standard cost	16,000m x £1.50	=	£24,000	
		Usage	>	£600 Adv
Standard usage at standard cost	1,300 units x 12m x £1.50	=	£23,400	

Direct labour

Actual hours at actual rate	5,000 hrs x £6.00	=	£30,000	
		Rate	>	£0
Actual hours at standard rate	5,000 hrs x £6.00	=	£30,000	
		Efficiency	>	£1,200 Fav
Standard hours at standard rate	1,300 units x 4 hrs x £6.00	=	£31,200	

Variable overhead

Actual hours at actual rate	5,000 hrs x £15.10	=	£75,500	
		Expenditure	>	£500 Adv
Actual hours at standard rate	5,000 hrs x £15.00	=	£75,000	
		Efficiency	>	£3,000 Fav
Standard hours at standard rate	1,300 units x 4 hrs x £15.00	=	£78,000	

Fixed overhead

Actual overhead		=	£54,600	
		Expenditure	>	£14,600 Adv
Budgeted overhead	1,000 units x 4 hrs x £10.00	=	£40,000	
		Capacity	>	£10,000 Fav
Actual hours at standard rate per hour	5,000 hours x £10.00	=	£50,000	
		Efficiency	>	£2,000 Fav
Standard overhead for actual production	1,300 units x 4 hrs x £10.00	=	£52,000	

Sales volume

Budgeted sales units at Standard profit margin	1,000 units x £108.00	=	£108,000	
			>	£21,600 Fav
Actual sales units at Standard profit margin	1,200 units x £108.00	=	£129,600	

Sales price

Actual sales at standard price	1,200 units x £250	=	£300,000	
			>	£12,000 Adv
Actual sales at actual price	1,200 units x £240	=	£288,000	

(b) Differences between standard absorption and standard marginal costing

Sales volume variance

This variance measures the effect on profit of selling more (or less) units than budgeted. Under absorption costing this is calculated at standard profit per unit. Note that in calculating standard profit per unit all costs, both fixed and variable, are charged against standard selling price. Under standard marginal costing the variance is calculated at standard contribution per unit. In calculating standard contribution per unit only standard variable costs are charged against standard selling price.

Fixed overhead variances

The expenditure variance (the difference between actual and budgeted expenditure) is the same under both approaches. Under absorption costing fixed overheads are charged to individual units of production via an overhead absorption rate. If production volume differs from that budgeted this can result in under or over absorption of overhead and resultant adverse or favourable volume variance. In turn this volume variance can be subdivided into capacity and efficiency variances. Under marginal costing, fixed overheads are not charged to individual units of production and thus no under or over absorption, or volume variance, occurs.

Stock valuation and its effect upon profit

The profit figures under the two systems may be different due to the different costing principles involved. Under absorption costing finished goods stock is valued at full production cost, which includes both fixed and variable production cost. Under a marginal costing system finished goods stock is valued at variable production cost only. This will result in differences in stock valuations and possibly differences in cost of sales figures. In a period when production is greater than sales (as in the most recent month) absorption costing will show the higher profit figure as a proportion of the current period's fixed production costs will be absorbed into units included in closing stock and be carried forward into the next period. This will result in absorption costing showing a lower cost of sales and a higher profit than marginal costing.

(c) Problems of standard costing in modern business organisations

The problems of standard costing variance analysis include:

- (i) Standard costing systems rely on the existence of repetitive operations and homogenous output. With increasing levels of competition and shortening product lifecycles, output is less homogenous and operations are not so repetitive.
- (ii) Standard costing places much emphasis on direct labour costs. In a modern manufacturing environment labour is often no longer a variable cost, and represents a small proportion of total cost.
- (iii) The use of labour hours in the calculation of overhead variances is also questionable as many overheads are not driven by labour activity.
- (iv) An emphasis on efficiency variances can focus management attention in the wrong areas. Just in time production systems are more concerned with meeting customer requirements than avoiding idle time.
- (v) Material price variances may over emphasise the importance of price at the expense of quality, delivery and supplier reliability.
- (vi) Variance analysis concentrates on costs and does not give sufficient attention to issues such as quality and customer satisfaction.
- (vii) Variance analysis is largely aimed at manufacturing situations; large parts of modern economies are now service industries.

(Note: only four criticisms were requested.)

2 (a) Budgeted profit, break-even point and margin of safety

Budgeted profit

Selling Price	£250 £	£350 £	£450 £
Contribution (w1)	300,000	1,040,000	1,380,000
Fixed costs	800,000	500,000	200,000
Profit/(loss)	<u>(500,000)</u>	<u>540,000</u>	<u>1,180,000</u>

Break-even point in units

Fixed cost	£800,000	£500,000	£200,000
Contribution per unit	£30 per unit = 26,667 units	£130 per unit = 3,846 units	£230 per unit = 870 units

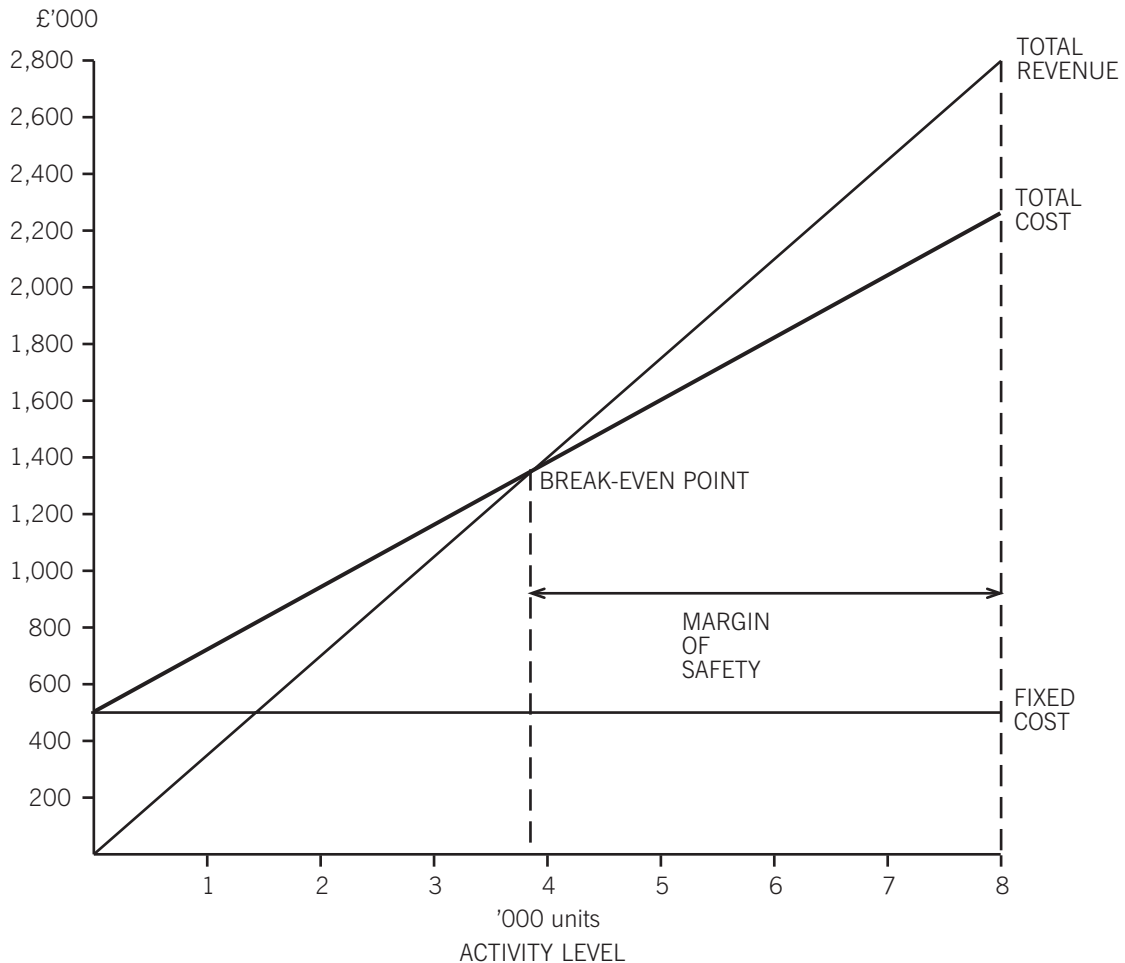
Margin of safety ratio

	= nil	8,000 – 3,846	6,000 – 870
		8,000	6,000
		= 52%	= 86%

working 1

	£ per unit	£ per unit	£ per unit
Selling price	250	350	450
Variable cost	<u>220</u>	<u>220</u>	<u>220</u>
Contribution per unit	30	130	230

(b) Break-even chart



(c) Target Costing

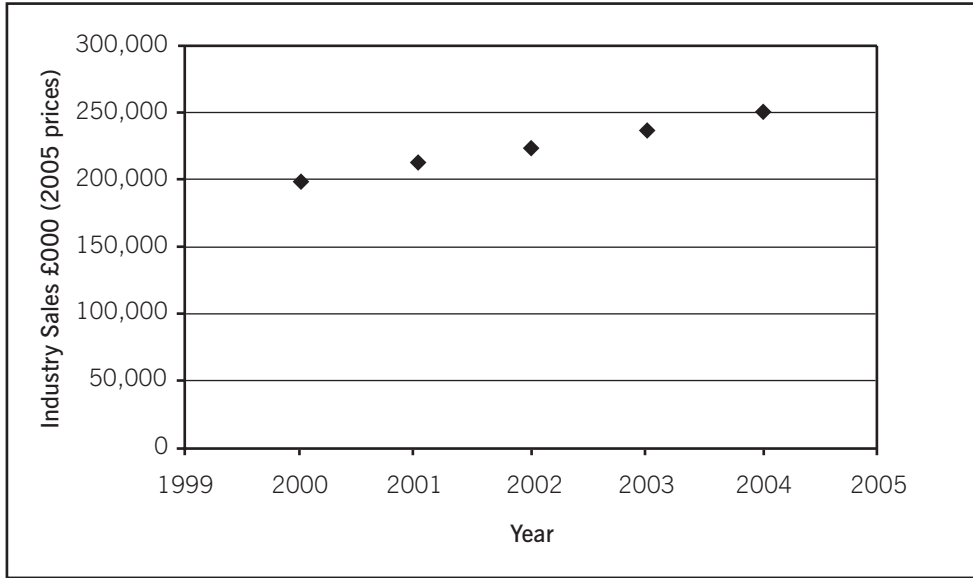
Target costing involves setting a target cost by subtracting a desired profit margin from a competitive market price. A target cost may be less than the planned initial cost but it is expected to be achieved by the time a product reaches its maturity stage of the product lifecycle.

To use target costing Hughes plc would firstly need to consider the product specification necessary in the current market (for example battery life, capacity, size, etc). It would then need to decide what selling price would be necessary to achieve its desired market share, probably by reference to competitors' prices. It would then need to decide upon a required profit margin on the product (this could be based upon a desired return on sales or a required return upon investment). The target cost could then be calculated by subtracting the required profit margin from the proposed selling price. Efforts could then be made to produce the required product at the target cost. These efforts are most likely to be successful at the design stage by, for example, reducing the number of components, using standard components, or by using different materials.

3 (a) Inflation adjustments

Year	Sales £ 000
2000	$175,000 \times \frac{113}{100} = 197,750$
2001	$193,025 \times \frac{113}{103} = 211,765$
2002	$211,225 \times \frac{113}{107} = 223,069$
2003	$229,250 \times \frac{113}{110} = 235,502$
2004	$247,100 \times \frac{113}{112} = 249,306$

(b) Scatter graph of industry sales



(c) Trend Line by high-low technique

The trend in sales can be expressed in the form $y = a + bx$
 Where y = industry sales pa in £000 (at 2005 prices)
 x = the year in question
 a = the intercept
 b = annual increments in the trend line

For ease of computation years will be denoted as follows 2000 = 0
 2001 = 1 etc

(other approaches are acceptable, see note below)

	Year	Sales £000 (2005 prices)
Highest year	4	249,306
Lowest year	0	197,750
	<u>4</u>	<u>51,556</u>

$$b = \frac{£51,556}{4} = £12,889$$

a by substitution

$$y = a + bx$$

$$249,306 = a + 12,889 \times 4$$

$$249,306 = a + 51,556$$

$$249,306 - 51,556 = a$$

$$a = £197,750$$

The trend in industry sales can be represented by the equation

$$y = 197,750 + 12,889x$$

Note: The value of a has little significance apart from in forecasting future sales. The value of a (the intercept) depends upon which year is taken as year 0. In this answer 2000 is taken as year 0, if another year had been taken as year zero the value of a , the intercept, would have been different, but the same predictions of future sales could be obtained. Full credit will be given to other approaches.

Forecast for 2005

$$y = 197,750 + 12,889x$$

$$y = 197,750 + 12,889 \times 5$$

$$y = £262,195 \text{ in 2005 prices}$$

Industry sales expressed in 2005 prices are forecast to be £262,195,000.

(d) Other factors in forecasting Case plc's sales.

Many factors could be influential including:

- The price of Case plc's product relative to the industry; a higher price may lead to a slower growth in sales.
- The quality of Case plc's product relative to the industry; inferior quality may lead to lower sales growth.
- Market research results could give an indication of future trends in demand.
- Advertising and promotional expenditure relative to competitors; a lower advertising spend may lead to lower sales growth.
- Other causal factors in demand such as levels of consumer income and the condition of the overall economy could be considered. Changes in these variables could affect demand.
- Future trends in industry sales, sales growth seldom continues forever and an assumption of linear growth in sales is probably unrealistic.

(only two factors were requested)

4 (a) Financial ratios

	2003		2004	
(i) Return on capital employed				
= $\frac{\text{Profit before interest and tax}}{\text{Capital employed}}$ %	$\frac{18.0}{105.6}$	= 17.0%	$\frac{16.5}{123.2}$	= 13.4%
(ii) Net profit margin				
= $\frac{\text{Profit before interest and tax}}{\text{Sales}}$ %	$\frac{18.0}{180.0}$	= 10.0%	$\frac{16.5}{185.0}$	= 8.9%
(iii) Asset turnover				
= $\frac{\text{Sales}}{\text{Capital employed}}$	$\frac{180.0}{105.6}$	= 1.7 times	$\frac{185.0}{123.2}$	= 1.5 times
(iv) Current ratio				
= $\frac{\text{Current assets}}{\text{Current liabilities}}$	$\frac{13.6}{8.4}$	= 1.6:1	$\frac{11.9}{9.2}$	= 1.3:1
(v) Capital gearing				
= $\frac{\text{Long-term debt}}{\text{Equity}}$ %	$\frac{35.0}{70.6}$	= 49.6%	$\frac{50.0}{73.2}$	= 68.3%

Note: other sensible definitions of the above ratios are acceptable, for example capital gearing is often calculated as

$$\frac{\text{Long-term debt}}{\text{Equity} + \text{Long-term debt}} \%$$

Equity + Long-term debt

This would give figures of 33.1% and 40.6% for 2003 and 2004 respectively.

(b) Financial Performance

Profitability

Return on capital employed has fallen over the two-year period. This is caused by a decrease in operating profit and an increase in capital employed. The fall in operating profit may be caused by an increase in costs (possibly associated with the new investments) and the increase in capital employed is clearly caused by the new investment programme. Asset turnover has fallen; this could be due to the new investment programme not yet having an effect on sales.

Overall the explanation for the deterioration in profitability could simply be a matter of timing. In the short term the programme has increased assets and costs (e.g. depreciation charges) but has not yet affected sales.

Liquidity

The current ratio has deteriorated. This means that the firm's ability to meet its short-term obligations from its short-term resources has reduced. This appears to be caused by the decrease in the cash balance, which could be explained by the expenditure on the investment programme.

Capital Gearing

Capital gearing has increased significantly. This appears to be due to the increase in bank loans, again, which is likely to be caused by the new investment programme. Although this is a significant increase it should not be regarded as dangerously high in a capital-intensive industry such as a railway.

(c) Non-financial indicators

Indicator	Importance
(1) % of trains on time	Punctuality is important to travellers
(2) % of trains cancelled	Reliability is important to travellers
(3) Accidents per 1,000,000 passengers	Safety is vital in railway travel
(4) Customer rating of cleanliness of facilities	Passengers require good quality service
(5) % utilisation of rolling stock	Idle assets do not earn profits
(6) % utilisation of staff	Idle staff do not earn profits
(7) % of new customers	New customers are vital for growth
(8) Employee morale	Motivated employees are vital for success in a service business

(only 3 indicators were required)

1	(a) 2 per variance max		22
	(b) Sales volume variance	4	
	Fixed overhead expenditure	1	
	Other fixed overhead variances	2	
	Stock valuation	2	
	Profit computation	1	
		<hr/>	10
	(c) 2 per point max		<u>8</u>
			40
2	(a) Budgeted profit	3	
	Break-even points	3	
	Margin of safety	3	
		<hr/>	9
	(b) Fixed cost	1	
	Total cost	1	
	Sales revenue	1	
	scaling	2	
	1 mark per useful label max	3	
		<hr/>	8
	(c) Target Costing defined	1	
	Use with music player	2	
		<hr/>	3
			<u>20</u>
3	(a) 1 mark per correct adjustment max		5
	(b) x-axis labelled	1	
	y-axis labelled	1	
	points	3	
		<hr/>	5
	(c) 'a'	2	
	'b'	2	
	forecast	2	
		<hr/>	6
	(d) 2 marks per explained point max		<u>4</u>
			20
4	(a) ROCE	2	
	Net profit margin	1	
	Asset turnover	1	
	Current ratio	2	
	Capital gearing	2	
		<hr/>	8
	(b) 1 per comment and 1 per cause, max		6
	(c) 1 per indicator and 1 for its importance		<u>6</u>
			20