Answers

Section A

1   C

OAR for fixed production overheads ($72 million/96 million hours) = $0·75 per hour

Total manufacturing costs (300,000 units x $20) = $6,000,000
Total design, depreciation and decommissioning costs = $1,320,000
Total fixed production overheads (300,000 units x 4 hours x $0·75) = $900,000
Total life-cycle costs = $8,220,000

Life-cycle cost per unit ($8,220,000/300,000 units) = $27·40

2   B

Two units of Y and one unit of X would give total contribution of $18.
Weighted average contribution per unit = $18/3 units = $6
Sales units to achieve target profit = ($90,000 + $45,000)/$6 = 22,500

3   A

3,000 units should use 10 kg each (3,000 x 10) = 30,000 kg
3,000 units did use = 29,000 kg
Difference = 1,000 kg favourable
Valued at $6·80 per kg ($68/10 kg)
Variance = $6,800 favourable

4   D

The tracking and summarising of critical strategic information is done by an Executive Information System (EIS).

The other three options are all likely to be potential benefits which would result from the introduction of an ERPS.

5   D

Under a system of flow cost accounting material flows are divided into three categories – material, system, and delivery and disposal.

6   C

Exam success will be a given objective of a school, so it is a measure of effectiveness.

7   B

Variance analysis is not relevant to target costing as it is a technique used for cost control at the production phase of the product life cycle. It is a feedback control tool by nature and target costing is feedforward.

Value analysis can be used to identify where small cost reductions can be applied to close a cost gap once production commences.

Functional analysis can be used at the product design stage. It ensures that a cost gap is reached or to ensure that the product design is one which includes only features which customers want.

Activity analysis identifies and describes activities in an organisation and evaluates their impact on operations to assess where improvements can be made.

8   A

A memory stick is much more likely to get mislaid and compromise security than a password protected laptop. It is likely that memory sticks could get lost or that information is left on home computers.

In the context of the scenario all the other options are good practice.

9 A

If the values for R and N are substituted into the constraints:

Labour required = (3 x 500) + (2 x 400) = 2,300 hours which is less than what is available so there is slack.
Machine time required = (0·5 x 500) + (0·4 x 400) = 410 hours which is exactly what is available and so there is no slack.

10 B

Revised annual profit = $190,000 + $10,000 profit on the sale of the asset = $200,000
Revised net assets = $1,000,000 – $40,000 NBV + $50,000 cash – $250,000 cash + $250,000 asset = $1,010,000
ROI = ($200,000/$1,010,000) x 100 = 19·8%

11 A

Throughput is determined by the bottleneck resource. Process 2 is the bottleneck as it has insufficient time to meet demand.

The only option to improve Process 2 is to improve the efficiency of the maintenance routine. All the other three options either increase the time available on non-bottleneck resources or increase demand for an increase in supply which cannot be achieved.

12 C

An operational variance compares revised price to actual price.

20,000 kg should cost $0·40 per kg at the revised price (20,000 kg x $0·40) = $8,000
20,000 kg did cost $0·42 per kg (20,000 kg x $0·42) = $8,400
Variance = $400 adverse

13 A

The material price when flexed is higher than budget whilst the external environment shows that prices are reducing. This indicates that although suppliers lowered their prices, the manager has still overspent which indicates poor performance.

When sales volumes and prices are flexed, it can be seen that the manager has performed better.

14 D

Penetration pricing involves setting a low price when a product is first launched in order to obtain strong demand.

It is particularly useful if significant economies of scale can be achieved from a high volume of output and if demand is highly elastic and so would respond well to low prices.

15 B

Total material budget ((1,000 units x $10) + (2,000 units x $20)) = $50,000
Fixed costs related to material handling = $100,000
OAR = $2/$ of material
Product B = $2 x $20 = $40

Total labour budget ((1,000 units x $5) + (2,000 units x $20) = $45,000
General fixed costs = $180,000
OAR = $4/$ of labour
Product B = $4 x $20 = $80

Total fixed overhead cost per unit of Product B ($40 + $80) = $120

Section B

16 A

The maximin rule selects the maximum of the minimum outcomes for each supply level.

For Mylo the minimum outcomes are:

450 lunches – $1,170
620 lunches – $980
775 lunches – $810
960 lunches – $740

The maximum of these is at a supply level of 450 lunches.

17 D

The minimax regret rule selects the minimum of the maximum regrets.

Demand level	Supply level			
	450	620	775	960
	$	$	$	$
450	–	190	360	430
620	442	–	217	322
775	845	403	–	230
960	1,326	884	481	–
Max regret	1,326	884	481	430

The minimum of the maximum regrets is $430, so suggests a supply level of 960 lunches.

18 B

Expected values do not take into account the variability which could occur across a range of outcomes; a standard deviation would need to be calculated to assess that, so Statement 2 is correct.

Expected values are particularly useful for repeated decisions where the expected value will be the long-run average, so Statement 4 is correct.

Expected values are associated with risk-neutral decision-makers. A defensive or conservative decision-maker is risk averse, so Statement 1 is incorrect.

Expected values will take into account the likelihood of different outcomes occurring as this is part of the calculation, so Statement 3 is incorrect.

19 A

This requires the calculation of the value of perfect information (VOPI).

Expected value with perfect information = (0·15 x $1,170) + (0·30 x $1,612) + (0·40 x $2,015) + (0·15 x $2,496) = $1,839·50

Expected value without perfect information would be the highest of the expected values for the supply levels = $1,648·25 (at a supply level of 775 lunches).

The value of perfect information is the difference between the expected value with perfect information and the expected value without perfect information = $1,839·50 – $1,648·25 = $191·25, therefore $191 to nearest whole $.

20 D

The investment's sensitivity to fixed costs is 550% ((385/70) x 100), so Statement 3 is correct.

The margin of safety is 84·6%. Budgeted sales are 650 units and BEP sales are 100 units (70/0·7), therefore the margin of safety is 550 units which equates to 84·6% of the budgeted sales, so Statement 4 is therefore correct.

The investment is more sensitive to a change in sales price of 29·6%, so Statement 1 is incorrect.

If variable costs increased by 44%, it would still make a very small profit, so Statement 2 is incorrect.

21 D

An 80% activity level is 210,000 units.

Material and labour costs are both variable. Material is $4 per unit and labour is $5·50 per unit.
Total variable costs = $9·50 x 210,000 units = $1,995,000
Fixed costs = $750,000
Supervision = $175,000 as five supervisors will be required for a production level of 210,000 units.

Total annual budgeted cost allowance = $1,995,000 + $750,000 + $175,000 = $2,920,000

22 B

Variable cost per hour ($850,000 – $450,000)/(5,000 hours – 1,800 hours) = $125 per hour
Fixed cost ($850,000 – (5,000 hours x $125)) = $225,000
Number of machine hours required for production = 210 batches x 14 hours = 2,940 hours
Total cost ($225,000 + (2,940 hours x $125)) = $592,500, therefore $593,000 to the nearest $'000.

23 C

If the budget is flexed, then the effect on sales revenue of the difference between budgeted and actual sales volumes is removed and the variance which is left is the sales price variance.

24 A

Flexible budgeting can be time-consuming to produce as splitting out semi-variable costs could be problematic, so Statement 1 is correct.

Estimating how costs behave over different levels of activity can be difficult to predict, so Statement 2 is correct.

A flexible budget will not encourage slack compared to a fixed budget, so Statement 3 is incorrect.

It is a zero-based budget, not a flexible budget, which assesses all activities for their value to the organisation, so Statement 4 is incorrect.

25 C

Spreadsheets can be used to change input variables and new versions of the budgets can be more quickly produced, so Statement 1 is correct.

Sensitivity analysis is also easier to do as variables are more easily changed and manipulated to assess their impact, so Statement 4 is correct.

A common problem of spreadsheets is that it is difficult to trace errors in a spreadsheet and data can be easily corrupted if a cell is changed or data is input in the wrong place, so Statement 2 is incorrect.

Spreadsheets do not show qualitative factors; they show predominantly quantitative data, so Statement 3 is incorrect.

26 D

Target costing does encourage looking at customer requirements early on so that features valued by customers are included, so Statement 2 is correct. It will also force the company to closely assess the design and is likely to be successful if costs are designed out at this stage rather than later once production has started, so Statement 4 is correct.

Statement 1 explains a benefit of flow cost accounting. Statement 3 explains the concept of throughput accounting.

27 A

Target price is $45 and the profit margin is 35% which results in a target cost of $29·25. The current estimated cost is $31·30 which results in a cost gap of $2·05.

28 C

Using more standardised components and using its own websites for marketing will reduce processing and marketing costs.

Using cheaper materials and trainee designers will reduce costs but could impact the quality and customer perception of the product which would impact the target price.

29 C

The change in the learning rate will increase the current estimated cost which will increase the cost gap.

The target cost will be unaffected as this is based on the target selling price and profit margin; neither of which are changing.

30 B

Services do use more labour relative to materials.

The other three statements are incorrect as uniformity is not a characteristic of services, there is no transfer of ownership and although it is difficult to standardise a service due to the human influence, target costing can still be used.

Section C

31 Jungle Co

Sales volumes

Since prices have remained stable year on year, it can be assumed that changes to revenue are as a result of increases or decreases in sales volumes. Overall, revenue has increased by 15%, which is a substantial increase. In order to understand what has happened in the business, it is necessary to consider sales by looking at each of the different categories.

Household goods

Although this was the largest category of sales for Jungle Co last year, this year it has decreased by 5% and has now been overtaken by electronic goods. The company changed suppliers for many of its household goods during the year, buying them instead from a country where labour was cheap. It may be that this has affected the quality of the goods, thus leading to decreased demand.

Electronic goods

Unlike household goods, demand for electronic goods from Jungle Co has increased dramatically by 28%. This is now Jungle Co's leading revenue generator. This is partly due to the fact that the electronic goods market has grown by 20% worldwide. However, Jungle Co has even outperformed this, meaning that it has secured a larger segment of the market.

Cloud computing service

This area of Jungle Co's business is growing rapidly, with the company seeing a 90% increase in this revenue stream in the last year. Once again, the company has outperformed the market, where the average growth rate is only 50%, suggesting that the investment in the cloud technology was worthwhile.

Gold membership fees

This area of the business is relatively small but has shrunk further, with a decrease in revenue of 30%. This may be because customers are dissatisfied with the service that they are receiving. The number of late deliveries for Gold members has increased from 2% to 14% since Jungle Co began using its own logistics company. This has probably been at least partly responsible for the massive increase in the number of customer complaints.

Gross profit margins

Overall, the company's gross profit margin (GPM) has increased from 37% to 42%. Whilst the GPM for electronic goods has only increased by 1 percentage point, the margin for household goods has increased by 10 percentage points. This is therefore largely responsible for the increase in overall GPM. This has presumably occurred because Jungle Co is now sourcing these products from new, cheaper suppliers.

Gold membership fees constitute only a small part of Jungle Co's income, so their 2 percentage point fall in GPM has had little impact on the overall increase in GPM. Cloud computing services, on the other hand, now make up over $12m of Jungle Co's sales revenue. For some reason, the GPM on these sales has fallen from 76% to 66%. This is now 14 percentage points less than the market average gross profit margin of 80%. More information is needed to establish why this has happened. It has prevented the overall increase in GPM being higher than it otherwise would have been.

Administration expenses/customer complaints

These have increased by 60% from $1·72m to $2·76m. This is a substantial increase. The costs of the customer service department are in here. Given the number of late deliveries increase from 2% to 14%, and the corresponding increase in customer complaints from 5% to 20%, it is not surprising that the administration costs have increased. As well as being concerned about the impact on profit of this increase of over $1m, Jungle Co should be extremely worried about the effect on its reputation. Bad publicity about reliable delivery could affect future business.

Distribution costs

Despite an increase in sales volumes of 15%, distribution expenses have increased by less than 2 percentage points. They have gone down from $0·16 to $0·14 per $ of revenue. Although this means that Jungle Co has been successful in terms of saving costs, as discussed above, the damage which late deliveries are doing to the business cannot be ignored. The company needs to urgently address the issue of late deliveries.

Net profit margin

This has increased from 19% to 25%. This means that, all in all, Jungle Co has had a successful year, with net profit having increased from $15·6m to $23·8m. However, the business must address its delivery issues if its success is to continue.

Gross profit margins	31 August 20X6	31 August 20X5
Household goods	40·00%	30·00%
Electronic goods	36·00%	35·00%
Cloud computing services	65·81%	75·77%
Gold membership fees	92·86%	95·00%
Overall	42·39%	37·19%
Net profit margin	25·15%	18·95%

Increase/decrease in revenue
Household goods	–5·27%
Electronic goods	28·28%
Cloud computing services	90·18%
Gold membership fees	–30·00%
Total revenue increase	14·99%

Increase/decrease in cost of sales
Household goods	–18·80%
Electronic goods	26·31%
Cloud computing services	168·35%
Gold membership fees	0·00%
Total cost of sales increase	5·46%

Increase in administration expenses	60·47%
Increase in distribution expenses	1·82%
Increase in other operating expenses	27·27%
Increase in costs of customer service department	120·93%
([$1,900,000 – $860,000]/$860,000)	

	31 August 20X6	31 August 20X5
Customer complaints as % customers	19·72%	4·92%
Delivery cost per $ of revenue	$0·14	$0·16

32 CSC Co

(a) (Step 1) Calculate the shortage of Betta for the year

Total requirements in grams:

Cakes: grams used per cake	0·5
Expected demand	11,200
Total required:	5,600

Cookies: grams used per cookie	0·20
Expected demand	9,800
Total required:	1,960

Shakes: grams used per shake	1
Expected demand	7,500
Total required:	7,500

Overall total required:	15,060
Less available:	12,000
Shortage:	**3,060**

(Step 2) Contribution per gram of Betta and ranking

	Cakes	Cookies	Shakes	Shakes (contract)
	$	$	$	$
Contribution per unit	2·60	1·75	1·20	1·00
Grams of Betta per unit	0·5	0·2	1	1
	$	$	$	$
Contribution per gram	5·20	8·75	1·20	1·00
Rank	2	1	3	4

(Step 3) Optimum production plan

Product	Number to be produced	Grams per unit	Total grams per product	Cumulative grams	Contribution per unit	Total contribution
Shakes (contract)	5,000	1	5,000	5,000	1·00	5,000
Cookies	9,800	0·20	1,960	6,960	1·75	17,150
Cakes	10,080	0·5	5,040	12,000	2·60	26,208
Total contribution						48,358
Less fixed costs						(3,000)
Profit						45,358

(b) Breach of contract with Encompass Health (EH)

It would be bad for business if CSC Co becomes known as a supplier who cannot be relied on to stick to the terms of its agreements. This could make future potential customers reticent to deal with them.

Even more seriously, there could be legal consequences involved in breaching the contract with EH. This would be costly and also very damaging to CSC Co's reputation.

If CSC Co lets EH down and breaches the contract, EH may refuse to buy from them any more and future sales revenue would therefore be lost. Just as importantly, these sales to EH are currently helping to increase the marketability of CSC Co's shakes. This will be lost if these sales are no longer made.

Therefore, taking these factors into account, it would not be advisable to breach the contract.

(c) (i) This line is what is called the 'iso-contribution line' and it is plotted by finding two corresponding x and y values for the 'objective function'. At any point along this line, the mix of cakes and cookies will provide the same total contribution, 'C'.

Since each cake provides a contribution of $2·60 and each cookie provides a contribution of $1·75, the objective function has been defined as 'C = 2·6x + 1·75y'. This means that the total contribution will be however many cakes are made (represented by 'x') at $2·60 each plus however many cookies are made (represented by 'y') at $1·75 each.

The area OABCD is called the 'feasible region'. Any point within this region could be selected and would show a feasible mix of production of cakes and cookies. However, in order to maximise profit, the optimum production mix will be at a point on the edge of the feasible region, not within it.

(ii) The further the iso-contribution line is moved away from the origin, O, the greater the contribution generated will be. Therefore, a ruler will be laid along the line, making sure it stays at exactly the same angle as the line, and the ruler will then be moved outwards to the furthest vertex (intersection between two constraints) on the feasible region, as represented by either point A, B, C or D. In this case, the optimum point is 'C', the intersection of the 'labour' constraint and the 'demand for cakes' constraint.

(iii) A 'slack' value could arise either in relation to a resource or in relation to production of a product. It means that a resource is not being fully utilised or that there is unfulfilled demand of a product. Since the optimum point is the intersection of the labour and the demand for cakes lines, this means that there will be three slack values. First, there will be a slack value for cookies. This means that there will be unsatisfied demand for cookies since the optimum point does not reach as far as the 'demand for cookies' line on the graph. Also, there will be slack values for Betta and Singa, which means that both of these materials are not actually the binding constraints, such that there will be more material available than is needed.

Section A   *Marks*

Each question is worth 2 marks   **30**

Section B

Each question is worth 2 marks   **30**

Section C

31   Jungle Co

Sales volumes (up to 2 marks per revenue stream)	8
COS and gross margins	5
Administration expenses/customer complaints	3
Distribution costs/late deliveries	2
Net profit margin	2
	20

32   CSC

(a)

Calculating shortage of Betta	1·5
Contribution per gram of Betta	1
Ranking	0·5
Optimum production plan	2
Profit	1
	6

(b)   Each valid point   1

                                                                                                   Maximum   **4**

(c) **(i)**

Identification and explanation of the iso-contribution line	2
Identification and explanation of the feasible region	2
	4

(ii)

Explaining how to use line for identification of optimum point	1·5
Identification of optimum point	0·5
	2

(iii)

Explaining what slack values are	1
Identifying Betta as slack	1
Identifying Singa as slack	1
Identifying slack demand for cookies	1
	4
	20