



CHARTERED ACCOUNTANTS EXAMINATIONS

PROFESSIONAL LEVEL

P2: ADVANCED MANAGEMENT ACCOUNTING

SERIES: JUNE 2013

TOTAL MARKS – 100 TIME ALLOWED: THREE (3) HOURS

INSTRUCTIONS TO CANDIDATES

1. You have fifteen (15) minutes reading time. Use it to study the examination paper carefully so that you understand what to do in each question. You will be told when to start writing.
2. This paper is divided into TWO sections:
Section A: One compulsory question.
Section B: Four Optional questions. Attempt any three (3) questions.
3. Enter your student number and your National Registration Card number on the front of the answer booklet. Your name must NOT appear anywhere on your answer booklet.
4. Do NOT write in pencil (except for graphs and diagrams).
5. The marks shown against the requirement(s) for each question should be taken as an indication of the expected length and depth of the answer.
6. All workings must be done in the answer booklet.
7. Discount Factor tables/Present Value and Annuity Tables are attached at the end of the question paper.
8. Graph paper (if required) is provided at the end of the answer booklet.

SECTION A

COMPULSORY QUESTION (40 MARKS)

QUESTION ONE

- (A) Kangwa Soup Limited manufactures and sells soups in a JIT environment. Soup is made in a manufacturing process by mixing liquidised vegetables, melted butter and stock (stock in this context is a liquid used in making soups). They operate a standard costing and variances system to control its manufacturing processes. At the beginning of the current financial year they employed a new production manager to oversee the manufacturing process and to work alongside the purchasing manager. The production manager will be rewarded by a salary and a bonus based on the directly attributable variances involved in the manufacturing process. After three months of work there is doubt about the performance of the new production manager. On the one hand, the cost variances look on the whole favourable, but the sales director has indicated that sales are significantly down and the overall profitability is decreasing.

The table below shows the variance analysis results for the first three months of the manager's work.

Table 1

F = Favourable.

A = Adverse

	Month 1	Month 2	Month 3
Material Price Variance	K300 (F)	K900 (A)	K2, 200 (A)
Material Mix Variance	K1,800 (F)	K2,253 (F)	K2,800 (F)
Material Yield Variance	K2,126 (F)	K5,844 (F)	K9,752 (F)
Total Variance	K4,226 (F)	K7,197 (F)	K10,352 (F)

The actual level of activity was broadly the same in each month and the standard monthly material total cost was approximately K145,000.

The standard cost card is as follows for the period under review

	K
0.90 litres of liquidised vegetables @ K0.80/ltr	0.72
0.05 litres of melted butter @K4/ltr	0.20
1.10 litres of stock @ K0.50/ltr	<u>0.55</u>
Total cost to produce 1 litre of soup	<u>1.47</u>

Required:

- (a) Using the information in Table 1:
- Explain the meaning of each type of variances above (price, mix and yield but excluding the total variance) and briefly discuss to what extent each type of variance is controllable by the production manager. (12 marks)
 - Evaluate the performance of the production manager considering both the cost variance results above and the sales director's comments. (6 marks)

- (b) The board has asked that the variances be calculated for Month 4. In Month 4 the production department data is as follows:

Actual results for Month 4

Liquidised vegetables: Bought 82,000 litres costing K69,700

Melted butter: Bought 4,900 litres costing K21,070

Stock: Bought 122,000 litres costing K58,560

Actual production was 112,000 litres of soup

Required:

Calculate the material price, mix and yield variances for Month 4. You are also required to comment on the performance that the calculations imply. Round variances to the nearest K. (12 marks)

- (B)** Mutelo Division, which is part of the Musonkho Group, is considering an investment opportunity to which the following estimated information relates:

- (1) An initial investment of K45m in equipment at the beginning of year 1 will be depreciated on a straight-line basis over a three-year period with a nil residual value at the end of year 3.
- (2) Net operating cash inflows in each of years 1 to 3 will be K12.5m, K18.5m and K27m respectively.
- (3) The management accountant of Mutelo Division has estimated that the NPV of the investment would be K1.937m using a cost of capital of 10%.
- (4) A bonus scheme which is based on short-term performance evaluation is in operation in all divisions within the Musonkho Group.

Required:

- (a) (i) Calculate the residual income of the proposed investment and comment briefly (using ONLY the above information) on the values obtained in reconciling the short-term and long-term decision views likely to be adopted by divisional management regarding the viability of the proposed investment. (6 marks)
- (ii) A possible analysis of divisional profit measurement of a division might include profit measures such as variable short run contribution margin, controllable profit and divisional profit. Discuss the relevance of the above divisional profit measures as an acceptable measure of divisional management performance for a division. (4 Marks)

(Total: 40 Marks)

SECTION B

ATTEMPT ANY THREE (3) QUESTIONS.

QUESTION TWO

Scores Co is evaluating the purchase of a new machine to produce product called Kiwaya, which has a short product life-cycle due to rapidly changing technology. The machine is expected to cost K1 million. Production and sales of Kiwaya are forecast to be as follows:

Year	1	2	3	4
Production and sales (units/year)	35,000	53,000	75,000	36,000

The selling price of Kiwaya (in current price terms) will be K20 per unit, while the variable cost of the product (in current price terms) will be K12 per unit. Selling price inflation is expected to be 4% per year and variable cost inflation is expected to be 5% per year. No increase in existing fixed costs is expected since Scores Co has spare capacity in both space and labour terms.

Producing and selling Kiwaya will call for increased investment in working capital. Analysis of historical levels of working capital within Scores Co indicates that at the start of each year, investment in working capital for Kiwaya will need to be 7% of sales revenue for that year.

Scores Co pays tax of 30% per year in the year in which the taxable profit occurs. Liability to tax is reduced by capital allowances on machinery (tax-allowable depreciation), which Scores Co can claim on a straight-line basis over the four-year life of the proposed investment. The new machine is expected to have no scrap value at the end of the four-year period.

Scores Co uses a nominal (money terms) after-tax cost of capital of 12% for investment appraisal purposes.

Required:

- (a) Calculate the net present value of the proposed investment in Kiwaya. (10 marks)
- (b) Calculate the internal rate of return of the proposed investment in Kiwaya. (3 marks)
- (c) Advise on the acceptability of the proposed investment in Kiwaya and discuss the limitations of the evaluations you have carried out. (3 marks)
- (d) Discuss how the net present value method of investment appraisal contributes towards the objective of maximising the wealth of shareholders. (4 marks)

(Total: 20 marks)

QUESTION THREE

Stay Clean manufactures and sells a small range of kitchen equipment. Specifically the product range contains a dishwasher (DW), a washing machine (WM) and a tumble dryer (TD). The TD is of a rather old design and has for some time generated negative contribution. It is widely expected that in one year's time the market for this design of TD will cease, as customers switch to a washing machine that can also dry clothes after the washing cycle has completed.

Stay Clean is trying to decide whether or not to cease the production of TD now *or* in 12 months' time when the new combined washing machine/drier will be ready. To help with this decision the following information has been provided:

1. The normal selling prices, annual sales volumes and total variable costs for the three products are as follows:

	DW	WM	TD
Selling price per unit	K200	K350	K80
Material cost per unit	K70	K100	K50
Labour cost per unit	K50	K80	K40
Contribution per unit	K80	K170	-K10
Annual sales	5,000 units	6,000 units	1,200 units

2. It is thought that some of the customers that buy a TD also buy a DW and a WM. It is estimated that 5% of the sales of WM and DW will be lost if the TD ceases to be produced.
3. All the direct labour force currently working on the TD will be made redundant immediately if TD is ceased now.

This would cost K6,000 in redundancy payments. If Stay Clean waited for 12 months the existing labour force would be retained and retrained at a cost of K3, 500 to enable them to produce the new washing/drying product.

Recruitment and training costs of labour in 12 months' time would be K1, 200 in the event that redundancy takes place now.

4. Stay Clean operates a just in time (JIT) policy and so all material cost would be saved on the TD for 12 months if TD production ceased now. Equally, the material costs relating to the lost sales on the WM and the DW would also be saved. However, the material supplier has a volume based discount scheme in place as follows:

Total annual expenditure (K)	Discount
0–600,000	0%
600,001–800,000	1%
800,001–900,000	2%
900,001–960,000	3%
960,001 and above	5%

Stay Clean uses this supplier for all its materials for all the products it manufactures. The figures given above in the cost per unit table for material cost per unit are net of any discount Stay Clean already qualifies for.

5. The space in the factory currently used for the TD will be sublet for 12 months on a short-term lease contract if production of TD stops now. The income from that contract will be K12,000.
6. The supervisor (currently classed as an overhead) supervises the production of all three products spending approximately 20% of his time on the TD production. He would continue to be fully employed if the TD ceases to be produced now.

Required:

- (a) Calculate whether or not it is worthwhile ceasing to produce the TD now rather than waiting 12 months (ignore any adjustment to allow for the time value of money).
(13 marks)
- (b) Explain two pricing strategies that could be used to improve the financial position of the business in the next 12 months assuming that the TD continues to be made in that period.
(4 marks)
- (c) Briefly describe three issues that Stay Clean should consider if it decides to outsource the manufacture of one of its future products.
(3 marks)

(Total: 20 marks)

QUESTION FOUR

Stick Co manufactures and sells its standard perfume by blending a secret formula of aromatic oils with diluted alcohol. The oils are produced by another company following a lengthy process and are very expensive. The standard perfume is highly branded and successfully sold at a price of K39.98 per 100 milliliters (mls).

Stick Co is considering processing some of the perfume further by adding a hormone to appeal to members of the opposite sex. The hormone to be added will be different for the male and female perfumes. Adding hormones to perfumes is not universally accepted as a good idea as some people have health concerns. On the other hand, market research carried out suggests that a premium could be charged for perfume that can 'promise' the attraction of a suitor.

The market research has cost K3, 000.

Data has been prepared for the costs and revenues expected for the following month (a test month) assuming that a part of the company's output will be further processed by adding the hormones.

The output selected for further processing is 1,000 litres, about a tenth of the company's normal monthly output. Of this, 99% is made up of diluted alcohol which costs K20 per litre. The rest is a blend of aromatic oils costing K18, 000 per litre. The labour required to produce 1,000 litres of the basic perfume before any further processing is 2,000 hours at a cost of K15 per hour.

Of the output selected for further processing, 200 litres (20%) will be for male customers and 2 litres of hormone costing K7, 750 per litre will then be added. The remaining 800 litres (80%) will be for female customers and 8 litres of hormone will be added, costing K12,000

per litre. In both cases the adding of the hormone adds to the overall volume of the product as there is no resulting processing loss.

Stick Co has sufficient existing machinery to carry out the test processing.

The new processes will be supervised by one of the more experienced supervisors currently employed by Stick Co.

His current annual salary is K35,000 and it is expected that he will spend 10% of his time working on the hormone adding process during the test month. This will be split evenly between the male and female versions of the product.

Extra labour will be required to further process the perfume, with an extra 500 hours for the male version and 700 extra hours for the female version of the hormone-added product. Labour is currently fully employed, making the standard product. New labour with the required skills will not be available at short notice.

Stick Co allocates fixed overhead at the rate of K25 per labour hour to all products for the purposes of reporting profits.

The sales prices that could be achieved as a one-off monthly promotion are:

- Male version: K75.00 per 100 ml
- Female version: K59.50 per 100 ml

Required:

- (a) Outline the financial and other factors that Stick Co should consider when making a further processing decision. Note: no calculations are required. (4 marks)
- (b) Evaluate whether Stick Co should experiment with the hormone adding process using the data provided. Provide a separate assessment and conclusion for the male and the female versions of the product. (14 marks)
- (c) Calculate the selling price per 100 ml for the female version of the product that would ensure further processing would break even in the test month. (2 marks)

(Total: 20 Marks)

QUESTION FIVE

You are the management accountant of the SOSA Group which manufactures an innovative range of products to provide support for injuries to various joints in the body. The group has adopted a divisional structure. Each division is encouraged to maximize its reported profit.

Division A, which is based in a country called Pepi, manufactures joint-support appliances which incorporate a 'one size fits all people' feature. A different appliance is manufactured for each of knee, ankle, elbow and wrist joints.

Budget information in respect of Division A for the year ended 31 December 2010 is as follows:

Support appliance	Knee	Ankle	Elbow	Wrist
Sales units (000's)	20	50	20	60
Selling price per unit (K)	24	15	18	9
Total variable cost of sales (K'000)	200	350	160	240

Each of the four support products uses the same quantity of manufacturing capacity. This gives Division A management the flexibility to alter the product mix as desired. During the year to 31 December 2010 it is estimated that a maximum of 160,000 support products could be manufactured.

The following information relates to Division B which is also part of the SOSA group and is based in Patali:

1. Division B purchases products from various sources, including from other divisions in SOSA group, for subsequent resale to customers.
2. The management of Division B has requested two alternative quotations from Division A in respect of the year ended 31 December 2010 as follows:

Quotation 1 – Purchase of 10,000 ankle supports.

Quotation 2 – Purchase of 18,000 ankle supports.

The management of the SOSA Group has decided that a minimum of 50,000 ankle supports must be reserved for customers in Pepi in order to ensure that customer demand can be satisfied and the product's competitive position is maintained in the Pepi market.

The management of the SOSA Group is willing, if necessary, to reduce the budgeted sales quantities of other types of joint support in order to satisfy the requirements of Division B for ankle supports. They wish, however, to minimise the loss of contribution to the Group.

The management of Division B is aware of another joint support product, which is produced in Patali, that competes with the Division A version of the ankle support and which could be purchased at a local currency price that is equivalent to K9 per support. SOSA Group policy is that all divisions are allowed autonomy to set transfer prices and purchase from whatever sources they choose. The management of Division A intends to use market price less 30% as the basis for each of quotations 1 and 2.

Required:

- (a) (i) The management of the SOSA Group has asked you to advise them regarding the appropriateness of the decision by the management of Division A to use an adjusted market price as the basis for the preparation of each quotation and the implications of the likely sourcing decision by the management of Division B.

Your answer should cite relevant quantitative data and incorporate your recommendation of the prices that should be quoted by Division A for the ankle supports in respect of quotations 1 and 2, that will ensure that the profitability of SOSA Group as a whole is not adversely affected by the decision of the management of Division B. (8 marks)

- (ii) Advise the management of Divisions A and B regarding the basis of transfer pricing which should be employed in order to ensure that the profit of the SOSA Group is maximised. (4 marks)

- (b) After considerable internal discussion concerning Quotation 2 by the management of SOSA Group, Division A is not prepared to supply 18,000 ankle supports to Division B at any price lower than 30% below market price. All profits in Patali are subject to taxation at a rate of 20%. Division A pays tax in Pepi at a rate of 40% on all profits.

Required:

Advise the management of SOSA Group whether the management of Division B should be directed to purchase the ankle supports from Division A, or to purchase a similar product from a local supplier in Patali. Supporting calculations should be provided. (8 marks)

(Total: 20 marks)

END OF PAPER

Present Value Table

Present value of 1 i.e. $(1 + r)^{-n}$

Where r = discount rate
 n = number of periods until payment

Periods (n)	Discount rate (r)										
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	1
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	2
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	3
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683	4
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	5
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564	6
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513	7
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	8
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424	9
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	10
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350	11
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	12
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290	13
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263	14
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	15
<hr/>											
(n)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%	
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833	1
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694	2
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579	3
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482	4
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402	5
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335	6
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279	7
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233	8
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194	9
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162	10
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135	11
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112	12
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093	13
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078	14
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.074	0.065	15

Annuity Table

Present value of an annuity of 1 i.e. $\frac{1 - (1 + r)^{-n}}{r}$

Where r = discount rate
 n = number of periods

Periods (n)	Discount rate (r)										
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	1
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736	2
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487	3
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170	4
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791	5
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355	6
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868	7
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335	8
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759	9
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145	10
11	10.37	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495	11
12	11.26	10.58	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814	12
13	12.13	11.35	10.63	9.986	9.394	8.853	8.358	7.904	7.487	7.103	13
14	13.00	12.11	11.30	10.56	9.899	9.295	8.745	8.244	7.786	7.367	14
15	13.87	12.85	11.94	11.12	10.38	9.712	9.108	8.559	8.061	7.606	15
(n)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%	
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833	1
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528	2
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106	3
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589	4
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991	5
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326	6
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605	7
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837	8
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031	9
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192	10
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327	11
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439	12
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533	13
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611	14
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675	15

P2
MODEL ANSWERS/SUGGESTED SOLUTIONS
JUNE 2013 EXAMINATIONS

SOLUTION ONE

(A) KANGWA SOUP Limited

(i) Meaning and Controllability of the variances

Material Price Variance

Indicates whether Kangwa Soup has paid more (adverse) or less (favourable) for its input materials than the standard

prices set for the period. For example, if a new supplier had to be found and the price paid was more than the standard price then Kangwa Soup would incur an extra cost. This extra cost is the price variance.

Price variances are controllable to the extent that Kangwa Soup can choose its suppliers. On the other hand, vegetables are a seasonal and weather dependent crop and therefore factors outside Kangwa Soups control can influence prices in the market. The key issue is that the production manager will not control the price paid that is the job of the Purchasing Manager.

Material Mix Variance

Considers the cost of a change in the mix of the ingredients to make soup. For example adding less butter (which is

expensive) and more stock (which is cheaper) will be a cheaper mix than the standard mix. A cheaper mix will result in a favourable variance.

The recipe determines the mix. The recipe is entirely under the control of the production manager.

Material Yield Variance

This shows the productivity of the manufacturing process. If the process produces more soup than expected then the yield will be good (favourable). At the moment 2.05 litres of input produces 1 litre of soup, if 2.05 litres of input produces more than 1 litre of soup then the yield is favourable. Greater yield than expected can be a result of operational efficiency or a change in mix.

The production manager controls the operational process so should be able to control the yield. Poor quality ingredients can damage yield but the production manager should be in control of quality and reject dubious ingredients. The production manager is also responsible for things like spillage. Higher spillage can also reduce yield.

(ii) Production manager's performance

Cost Efficiency

The production manager has produced significant favourable cost variances. The total favourable variance has risen from K4,226 to K10,352 in the first three months. This last figure represents approximately 7.1% of the standard monthly spend.

The prices for materials have been rising but are probably outside the control of the production manager. The rising prices may have put pressure on the production manager to cheapen the mix.

The mix has become cheaper. This could be seen as a cost efficient step. However, Kangwa Soup must question the quality implications of this (see later).

The yield results are the most significant. The manager is getting far more out of the process than is usual. The new mix is clearly far more productive than before. This could easily be seen as an indicator of good performance as long as the quality is maintained.

Quality

The concern is that the production manager has sacrificed quality for lower cost and greater quantity. The sales director has indicated that sales are falling, perhaps an indication that the customers are unhappy with the product when compared to competitor offers. The greater yield and cheaper mix may well have produced a tasteless soup.

Overall

Overall there has to be concern about the production manager's performance. Cost control and efficiency are important but not at the expense of customer satisfaction and quality. We do not have figures for the extent to which sales have been damaged and small reductions may be acceptable.

(iii) Changes to the performance management system

The performance management system needs to take account of the quality of the soup being produced and the overall impact a decision has on the business.

Quality targets need to be agreed with the manager. These are difficult to quantify but not impossible. For example soup consistency (thickness) is measurable. Regular tasting will indicate a fall in quality; tasters could give the soup a mark out of 10 on taste, colour, smell etc.

The production manager should not be rewarded for producing lots of cheap soup that cannot be sold. The performance management system should reflect the overall effect that decisions have. If the production manager's actions have reduced sales then sales volume variances should be allocated to the production manager as part of the performance assessment.

(b) Variance calculations

Material Price Variance

$$\text{Mixed Vegetables: } \left(\frac{(69,700)}{82,000} \right) - 0.80 \times 82,000 = \text{K4,100 (A)}$$

$$\text{Butter: } \left(\frac{(21,070)}{4,900} \right) - 4 \times 4,900 = \text{K1,470 (A)}$$

$$\text{Stock: } \left(\frac{(58,560)}{122,000} \right) - 0.50 \times 122,000 = \text{K2,440 (F)}$$

Material Mix Variance

$$\text{Mixed Vegetables: } (82,000 - 91,712.2^*) \times 0.80 = \text{K7,770 (F)}$$

$$\text{Butter: } (4,900 - 5,095.1) \times 4 = \text{K780 (F)}$$

$$\text{Stock: } (122,000 - 112,092.7) \times 0.50 = \text{K4,954 (A)}$$

$$\text{Total Mix Variance } \quad \text{K3,596 (F)}$$

Note: it is only the total mix variance that is a valid variance here

$$\text{Total input volume} = (82,000 + 4,900 + 122,000) = 208,900$$

* Standard mix for mixed vegetables is = K91,712.2

Note: alternate approaches are acceptable.

Material Yield Variance

$$[112,000 - 101,902.4] \times 1.47 = \text{K14,843(F)}$$

The standard inputs add up to 2.05 units (0.9+0.5+1.1). This produces 1ltr of soup. The actual inputs were 208,900 litres and therefore the standard expected output should be

$$208,900 \times \frac{1}{2.05} = 101,902.4 \text{ litres}$$

(B) (i)

	Year 1	Year 2	Year 3
	Km	Km	Km
Net cash inflow	12.5	18.5	27.0
Less: Depreciation	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>
Profit/(loss)	(2.5)	3.5	12.0
Less: cost of capital (at 10% of wdv)	<u>(4.5)</u>	<u>(3.0)</u>	<u>(1.5)</u>
RI	<u>(7.0)</u>	<u>0.5</u>	<u>10.5</u>

A positive NPV of K1.937m indicates that the performance is acceptable over the three-year life of the proposal.

The RI shows a negative value of K7m in year 1. This is likely to lead to its rejection by the management of Alpha

Division because they participate in a bonus scheme that is based on short-term performance evaluation.

The short-term focus on performance evaluation might lead to the rejection of investment opportunities such as the one under consideration which would be detrimental to the Delta Group. Management of the Delta Group should give immediate consideration to changing the focus of the bonus scheme.

(ii) Measures of divisional profitability may be viewed as evaluating managerial performance and/or economic performance of the division. Management are likely to take the view that any contribution value used as a measure of their performance should only contain revenue or cost elements over which they have control. If each of the measures 1 to 3 shown in the question are considered the following analysis may be made:

1. Variable short run contribution margin:

This measure may be viewed as unacceptable to divisional management where it contains inter-divisional transfers. In this case this should not be a problem since the use of adjusted market price is in effect equivalent to external selling price after the deduction of cost elements (e.g. special packaging) that are not appropriate to inter-divisional transfers.

2. Controllable profit:

This measure will be calculated by deducting controllable fixed costs from the variable short-run contribution. These costs may include labour costs and/or equipment rental costs that are fixed in the short term but are subject to some influence by divisional management. For example, divisional management action may enable efficiency gains to be achieved in order to reduce the level of fixed labour or equipment rental costs that are incurred. In addition, it will be relevant to determine whether divisional management is free to source such items as they wish or if there is some direction for them to use, for example, a Delta Group Service Division for equipment rental requirements.

The inclusion of depreciation of fixed assets as a charge in evaluating controllable contribution may be debated depending on the extent to which divisional management has control over investment decisions.

3. Divisional profit:

Depending on the extent to which investment decisions relating to Alpha Division are ultimately authorised at Delta

Group level, depreciation may be viewed as a non-controllable cost, chargeable in arriving at the divisional profit and

hence as part of divisional economic performance measurement.

Other non-controllable costs attributed to the division may be a share of Group finance and legal staff costs for services provided to the division. Such costs are non-controllable by divisional management and may be viewed as avoidable only if the division was closed.

The divisional profit figure is useful in evaluating the economic performance of the division in that it represents the contribution made by Alpha Division towards the overall profitability of the Delta Group.

SOLUTION TWO

Calculation of net present value

Year	0	1	2	3	4
	K	K	K	K	K
Sales revenue		728,000	1,146,390	1,687,500	842,400
Variable costs		(441,000)	(701,190)	(1,041,750)	(524,880)
Contribution		287,000	445,200	645,750	317,520
Capital allowances		(250,000)	(250,000)	(250,000)	(250,000)
Taxable profit		37,000	195,200	395,750	67,520
Taxation		(11,100)	(58,560)	(118,725)	(20,256)
After-tax profit		25,900	136,640	277,025	47,264
Capital allowances		250,000	250,000	250,000	250,000
After-tax cash flow		275,900	386,640	527,025	297,264
Initial investment	(1,000,000)				
Working capital	(50,960)	(29,287)	(37,878)	59,157	58,968
Net cash flows	(1,050,960)	246,613	348,762	586,182	356,232
Discount at 12%	1.000	0.893	0.797	0.712	0.636
Present values	(1,050,960)	220,225	277,963	417,362	226,564

NPV = K91,154

SOLUTION THREE

(a) The relevant costs of the decision to cease the manufacture of the TD are needed:

Cost or Revenue	Working reference	Amount	(K)
Lost revenue	Note 1		(96,000)
Saved labour cost	Note 2	48,000	248,000
Lost contribution from other products	Note 3		(118,500)
Redundancy and recruitment costs	Note 4		(3,700)
Supplier payments saved	Note	88,500	588,500
Sublet income		12,000	12,000
Supervisor	Note	60	60
Net cash flow			(69,700)

Conclusion: It is not worthwhile ceasing to produce the TD now.

Note 1: All sales of the TD will be lost for the next 12 months, this will lose revenue of 1,200 units x K80 = K96,000

Note 2: All normal labour costs will be saved at 1,200 units x K40 = K48,000

Note 3: Related product sales will be lost.

This will cost the business 5% x ((5,000u x K150) + (6,000u x K270)) = K118,500 in contribution (material costs are dealt with separately below)

Note 4: If TD is ceased now, then:

Redundancy cost	(K6,000)
-----------------	----------

Retraining saved	K3,500
Recruitment cost	(K1,200)
Total cost	(K3,700)

Note 5. Supplier payments:

	DW (K)	WM (K)	TD (K)	Net cost(K)	Discount	Gross cost(K)
Current buying cost	350,000	600,000	60,000	1,010,000	5%	1,063,158
Loss of TD		(60,000)	(60,000)		5%	(63,158)
Loss of related sales at cost	(17,500)	(30,000)	(47,500)		5%	(50,000)
New buying cost				921,500	3%	950,000
Difference in net cost				88,500		

Note 6: There will be no saving or cost here as the supervisor will continue to be fully employed.

An alternative approach is possible to the above problem:

Cash flow	Ref Amount	(K)
Lost contribution	- TD Note 7	12,000
Lost contribution - other products	Note 8	(71,000)
Redundancy and recruitment	Note 4 above	(3,700)
Lost discount	Note 9	(19,000)
Sublet income		12,000
Supervisor	Note 6 above	0
Net cash flow		(69,700)

Note 7: There will be a saving on the contribution lost on the TD of 1,200 units x K10 per unit = -K12,000

Note 8: The loss of sales of other products will cost a lost contribution of 5% ((5,000 x K80) + (6,000 x K170)) = K71,000

Note 9

	DW (K)	WM (K)	TD (K)	Net cost(K)	Discount	Gross cost(K)
Current buying cost	350,000	600,000	60,000	1,010,000	5%	1,063,158
Saved cost	(17,500)	(30,000)	(60,000)			
New buying cost	332,500	(570,000)	0	902,500	5%	950,000
				921,500	3%	950,000
Lost discount				(19,000)		

(b) Complementary pricing

Since the washing machine and the tumble dryer are products that tend to be used together, Stay Clean could link their sales with a complementary price. For example they could offer customers a discount on the second product bought, so if they buy (say) a TD for K80 then they can get a WM for (say) K320. Overall then Stay Clean make a positive contribution of K130 ($320 + 80 - 180 - 90$).

Product line pricing

All the products tend to be related to each other and used in the utility room or kitchen. Some sales will involve all three products if customers are upgrading their utility room or kitchen for example. A package price could be offered and as long as Stay Clean make a contribution on the overall deal then they will be better off.

(c) Outsourcing requires consideration of a number of issues (only 3 required):

- The cost of manufacture should be compared to cost of buying in from the outsourcer. If the outsourcer can provide the same products cheaper then it is perhaps preferable
- The reliability of the outsourcer should be assessed. If products are delivered late then the ultimate customer could be disappointed. This could damage the goodwill or brand of the business.
- The quality of work that the outsourcer produces needs to be considered. Cheaper products can often be at the expense of poor quality of materials or assembly.
- The loss of control over the manufacturing process can reduce the flexibility that Stay Clean has over current production. If Stay Clean wanted, say, to change the colour of a product then at present it should be able to do that. Having contracted with an outsourcer this may be more difficult or involve penalties.

SOLUTION FOUR

- (a)** Stick should consider the following factors when making a further processing decision.
- Incremental revenue. The new perfume, once further processed, should generate a higher price and the extra revenue is clearly relevant to the decision.
 - Incremental costs. A decision to further process can involve more materials and labour. Care must be taken to only include those costs that change as a result of the decision and therefore sunk costs should be ignored. Sunk costs would include, for example, fixed overheads that would already be incurred by the business before the further process decision was taken. The shortage of labour means that its 'true' cost will be higher and need to be included.
 - Impact on sales volumes. Stick is selling a 'highly branded' product. Existing customers may well be happy with the existing product. If the further processing changes the existing product too much there could be an impact on sales and loyalty.
 - Impact on reputation. As is mentioned in the question, adding hormones to a product is not universally popular. Many groups exist around the world that protest against the use of hormones in products. Stick could be damaged by this association.
 - Potential legal cases being brought regarding allergic reactions to hormones.
- (b)** Production costs for 1,000 litres of the standard perfume

	K
Aromatic oils 10 ltrs x K18,000/ltr	180,000
Diluted alcohol 990 ltrs x K20/ltr	19,800
Material cost	199,800
Labour 2,000 hrs x K15/hr	30,000
Total	229,800
Cost per litre	229.80
Sales price per litre	399.80

Lost contribution per hour of labour used on new products

$$(K399,800 - K199,800) \div 2,000 \text{ hrs} = K100/\text{hr}$$

Incremental costs

		Male version		Female version	
		K		K	
Hormone	2 ltr x K7,750/ltr	15,500	8 ltr x K12,000/ltr	96,000	
Supervisor	Sunk cost	0	Sunk cost	0	
Labour	500 hrs x K100/hr	50,000	700 hrs x K100/hr	70,000	
Fixed cost	Sunk cost	0	Sunk cost	0	
Market research	Sunk cost	0	Sunk cost	0	
Total		<u>65,500</u>		<u>166,000</u>	

Incremental revenues

Male version Female version

	K		K
Standard 200 ltr x K399·80/ltr	79,960	800 ltr x K399·80	319,840
Hormone added 202 ltr x K750/ltr	151,500	808 ltr x K595/ltr	480,760
Incremental revenue	71,540		160,920
Net benefit/(cost)	6,040		(5,080)

The Male version of the product is worth further processing in that the extra revenue exceeds the extra cost by K6,040.

The Female version of the product is not worth further processing in that the extra cost exceeds the extra revenue by K5,080.

In both cases the numbers appear small. Indeed, the benefit of K6,040 may not be enough to persuade management to take the risk of damaging the brand and the reputation of the business. To put this figure into context: the normal output generates a contribution of K170 per litre and on normal output of about 10,000 litres this represents a monthly contribution of around K1·7m (after allowing for labour costs).

Future production decisions are a different matter. If the product proves popular, however, Stick might expect a significant

increase in overall volumes. If Stick could exploit this and resolve its current shortage of labour then more contribution could be created. It is worth noting that resolving its labour shortage would substantially reduce the labour cost allocated to the hormone added project. Equally, the prices charged for a one off experimental promotion might be different to the prices that can be secured in the long run.

- (c) The selling price charged would have to cover the incremental costs of K166,000. For 808 litres that would mean the price would have to be

$$\frac{(K166,000 + K319,840)}{808 \text{ ltrs}} = K601·29/\text{ltr}$$

or about K60·13 per 100 ml.

This represents an increase of only 1·05% on the price given and so clearly there may be scope for further consideration of this proposal.

- (d) Outsourcing involves consideration of many factors, the main ones being:

- Cost. Outsourcing often involves a reduction in the costs of a business. Cost savings can be made if the outsourcer has a lower cost base than, in this case, Stick. Labour savings are common when outsourcing takes place.
- Quality. Stick would need to be sure that the quality of the perfume would not reduce. The fragrance must not change at all given the product is branded. Equally Stick should be concerned about the health and safety of its customers since its perfume is 'worn' by its customers

- Confidentiality. We are told that the blend of aromatic oils used in the production process is 'secret'. This may not remain so if an outsourcer is employed. Strict confidentiality should be maintained and be made a contractual obligation.
- Reliability of supply. Stick should consider the implications of late delivery on its customers.
- Primary Function. Stick is apparently considering outsourcing its primary function. This is not always advisable as it removes Stick's reason for existence. It is more common to outsource a secondary function, like payroll processing for example.
- Access to expertise. Stick may find the outsourcer has considerable skills in fragrance manufacturing and hence could benefit from that.

SOLUTION FIVE

- (a) (i)** As regards Quotation 1 in respect of the year ending 31 December 2010, the management of Division B would purchase ankle supports from a local supplier in order to increase the profitability of Division B. An internal transfer price from Division A of K10.50 (K15 less 30%) would appear unattractive in comparison with a locally available price of K9. The management of Division B is encouraged to seek the maximisation of reported profit as its key objective.

Division A has spare production capacity of 10,000 units (Maximum available = 160,000 units and the 2010 budget total demand is 150,000 units). Division A could, therefore, supply 10,000 units of ankle supports at its marginal cost of K7 per unit ($K350,000/50,000$) i.e. at a total cost of K70,000. However the external supplier would charge K9 per unit, giving a total price of K90,000 for the 10,000 units.

In order to have decisions leading to the maximisation of SOSA group profit, Division A should, therefore, quote its marginal cost of K7 per unit for each of the 10,000 units required by Division B.

SOSA Group profit will then increase by $(K9 - K7) \times 10,000 = K20,000$.

As regards Quotation 2 in respect of the year ending 31 December 2010, the management of Division B would again

purchase from a local supplier in order to increase the reported profitability of the division if Division A quotes a transfer price of K10.50 (K15 less 30%).

Division A could potentially have supplied 18,000 ankle supports by using (i) spare capacity for 10,000 units and (ii) switching 8,000 units of production from sales of the type of support that earns the lowest contribution per unit.

The 10,000 units of spare capacity can be supplied at marginal cost of K7 per unit as in Quotation 1.

The additional 8,000 units would have to be diverted from the type of existing support that earns the lowest contribution per unit. The situation is as follows:

Product Knee Support Ankle Support Elbow Support Wrist Support

Selling price per unit (K)	24	15	18	9
Variable cost per unit (K)	10	7	8	4
Contribution per unit (K)	14	8	10	5

Division A should offer to transfer the additional 8,000 ankle supports by diverting production from the least profitable

type of support. The wrist support earns the lowest contribution per unit (K5). Hence Division A should offer to transfer

the additional 8,000 ankle supports at marginal cost + contribution foregone = K7 + K5 = K12.

In this case, Division B would reject the offer and would buy externally at K9 per unit. This would ensure that SOSA Group profit is not adversely affected by any transfer decision.

- (ii)** The management of the SOSA Group needs to ensure that the management of all divisions takes into consideration all internal and external information relevant to divisional and, much more importantly, group circumstances.

As a starting point, the basic principle which underpins transfer pricing is that transfer prices should be set at a level which covers the marginal costs plus any opportunity cost to the SOSA Group. If the basic principle is applied correctly then any subsequent decision made regarding whether to make internal transfers or external sales of products or internal purchases as opposed to external sourcing of products should lead to the most profitable outcome from the standpoint of the group as a whole.

What is best for the SOSA Group as a whole is dependent upon the capacity utilisation of its divisions. In this example everything depends on the capacity utilisation of Division A.

What is of vital importance is that the marginal revenues and marginal costs of the SOSA Group are known, understood and applied by management.

- (b) (i)** If Division B buys from a local supplier the financial implications for the SOSA group are as follows:

Division A sales: K60,000 wrist supports at a contribution of K5 per unit	300,000
Taxation at 40%	<u>120,000</u>
After tax benefit of sales	180,000
Division B purchases:	
18,000 ankle supports at a cost of K9 per unit	162,000
Taxation benefit at 20%	<u>32,400</u>
After tax cost of purchases	129,600
Net benefit to SOSA Group = K180,000 – K129,600	K50,400

If Division B buys internally from Division A the financial implications for SOSA group are as follows:

	K
Division A sales:	
External:	
52,000 wrist supports at a contribution of K5 per unit	260,000
18,000 ankle supports to Division B at a contribution of (K15 x 70%) – K7 = K3.5 per unit	63,000
	323,000
Taxation at 40%	129,200
After tax benefit of sales	193,800
Division B purchases:	
18,000 ankle supports at cost of K10.50 per unit	189,000
Taxation benefit at 20%	37,800
After tax cost of purchases	151,200
Net benefit to SOSA Group	K42,600

The SOSA group will be $K50,400 - K42,600 = K7,800$ worse off if Division B purchases the ankle supports from Division

A, as opposed to purchasing an equivalent product from a local supplier.

SOLUTION SIX:

To: CEO

From: A Accountant

Date: 9 December 2010

Subject: Costing systems and budgetary controls at RL

Introduction

Firstly, the costing and pricing methods are reviewed and results compared between the current absorption costing method and one using Activity Based Costing (ABC). Then, the impact of the choice of cost system is evaluated. Finally, the report provides an explanation of how a company could eliminate its use of budgets but still remain in control of the business and an evaluation of whether this would be a suitable choice for RL.

(a) Costing systems

The costing system is important in RL not just as a method of reporting activities in the business but also because it sets the price that the customer pays and so affects competitiveness. Absorption costing is a traditional system of allocating overhead costs to products based on production activity (labour hours in RL's case). ABC is an alternative for the allocation of overheads intended to capture the different activities that lead to costs being incurred. The principle benefit of ABC is that identification and monitoring of these activities leads to more accurate cost control.

ABC is most appropriate where overheads form a large proportion of the costs (at RL they are 23% of the total which is significant but not dominant). ABC is most often used in manufacturing where there are small batch sizes and significant tailoring of the product to customer specifications as is the case with RL.

Using Order 11784 as an example, RL would normally have calculated the cost per unit of this order at K2,556 and priced it at K3,706. Using ABC, RL would have costed the units at K3,194 each and priced them at K4,631, which represents an increase of 25%. The overhead allocated to the order by the traditional method is K596 while ABC allocates K1,234 per unit sold on the order. (The detailed workings are in the attached appendix.)

ABC has captured a significant underpricing of this order. The major components of the overhead can now be identified as the time spent discussing the order and the number of purchase orders that subsequently had to be raised. Management should now investigate whether such orders should be repriced at a different margin or whether action needs to be taken to make the call handling and purchasing associated with the order more efficient. The impact on the customer and competitive position of RL should be considered especially regarding any increase in selling price.

(b) Beyond Budgeting

The monitoring of variances between actual and budgeted variance is often the primary control mechanism available to the management of a company. Therefore, the suggestion of dropping the process which forms a major part of the finance department's efforts in a year is likely to be greeted with surprise.

The process known as going beyond budgeting involves replacing the annual system of a centrally created budget with a more flexible system of targets. Performance measurement changes from monitoring variances from the budget towards measuring achievement of strategic goals, adding value and performance against suitable benchmarks.

The new system will use forecasts produced and revised regularly by the line managers, thus devolving decision-making. The forecasts will often be more important for cashflow monitoring rather than cost control. The targets are intended to guide rather than constrain the line managers thus improving their motivation.

The approach of going beyond budgeting is considered appropriate in industries where there are rapid changes in the business environment and where intangibles such as know-how are key to competitive advantage. This appears to be the case for RL as it operates in a sector dominated by technological change. The traditional budgetary approach has drawn criticism as it sets fixed targets which are not responsive to change during the budget period. The method also sits uncomfortably with management methods such as total quality approaches since they tend to preach a continuous improvement to processes.

Budgets can also struggle in organisations using other radical change approaches to management such as business process re-engineering. As RL has been going through a period of poor performance, change is likely to be a feature of its operation in the near future.

Budgets are also criticised as stifling creativity in organisations. This creativity may help RL in finding solutions to its current financial difficulties. Budgets can be perceived as an imposition of top-down control and so conflict with giving all employees power to make decisions. A culture of innovation and employee empowerment would help to combat the problems faced by RL of losses of competitive position and key staff.

Finally, budgets can encourage gaming behaviour where staff act in the interests of expanding or padding their own budgets without considering the overall impact on the company. The focus on value-added targets of going beyond budgeting can help to avoid such dysfunctional behaviour.

Conclusion

A costing system change may be warranted as ABC appears to provide valuable additional information that will assist RL in addressing its financial problems. A detailed cost benefit analysis will have to be undertaken to identify if the extra work in collecting data on activities is warranted by this improvement in information for decision-making.

ABC cost	K
	1,960.00
Direct	
O/hd allocation using ABC:	
Customer service	
Purchasing and receiving	458.13
Stock management	75.86
Administration of production	106.60
	3,193.87
Profit element	1,437.24
Price	4,631.11
Difference between methods	24.9%