
CERTIFIED ACCOUNTING TECHNICIAN (CAT)
STAGE 3 EXAMINATION
S3.2 MANAGEMENT ACCOUNTING
PILOT PAPER

ANSWERS

Section A - Answer Grid

1. E
2. B
3. C
4. B
5. A
6. B
7. A
8. E
9. C
10. B

Section A - Suggested solutions

Marking scheme

	Marks
2 marks for each correct answer	2
Total marks for this section	20

1. E Since this is a profit centre and not an investment centre, the manager cannot make decisions about buying property, plant and equipment, so (i) depreciation and (iii) interest on loans to buy those machines are not controllable by the manager. Head office costs (ii) are clearly outside of the scope of the production manager, so are not controllable either. Therefore none of the items are controllable.

(Principles of budgeting 1.1)

2. B The principal budget factor is the constraint that limits the output of an organisation. It is often sales demand, but may be something else, such as a material or type of labour that is in limited supply. The budget for the principal budget factor is prepared first, and the other budgets are based on this.

(Principles of budgeting 2.3)

3. C A: In this case, the line would become steeper after 40 hours.
 B: The cost line would initially be steeper, becoming less steep once the lower prices kick in. However, the less steep line would start where the steeper line ends.
 C: This is correct. The initially steep line represents the higher cost below the discount threshold. Once the threshold is exceeded, a discount is applied to all units, so the total cost line falls, before continuing at a flatter shape.
 D: The cost line would not start at the origin, point (0,0), because even if output is zero, there will be some fixed cost.

(Principles of managing financial performance 2.5)

4. B Adjusted sales for 2020 is $535,600 \times 142.4/156.3 = 487,968$. Fall in sales is therefore $((487,968/520,000) - 1) = -0.616$ or a fall of 6.2%.

Answer A would be achieved by incorrectly dividing the 2020 adjusted sales by the 2020 sales instead of the 2019 sales.

Answer C is the 'nominal' increase in sales – before adjusting for the effects of inflation.

Answer D is obtained if you used the CPI index for 2020 divided by the CPI index for 2019, rather than the CPI index for 2019 divided by the CPI index for 2020.

(Measuring financial performance 2.1)

$$5. \quad A \quad \text{Efficiency ratio} = \frac{\text{Standard hours for actual output}}{\text{Actual hours worked}} = \frac{8.5}{9} = 94.4\%$$

$$\text{Capacity ratio} = \frac{\text{Actual hours worked}}{\text{Budgeted hours}} = \frac{9}{8} = 112.5\%$$

$$\text{Activity ratio} = \frac{\text{Standard hours for actual output}}{\text{Budgeted hours}} = \frac{8.5}{8} = 106.25\%$$

(Measuring financial performance 2.5)

6. B (i) Segregation of duties between making payments and recording those payments would reduce the risk of false payments being made, but would not reduce the risk of selecting the wrong supplier in the first place.
- (ii) Rotation of procurement managers would have reduced the risk of the fraud, as knowing that future procurement managers could discover the fraud might have deterred the purchasing manager from taking part.
- (iii) Requiring the procurement manager to sign all purchase orders would not have stopped the fraud.
- (iv) Requiring three written quotations would make the procurement decision more transparent. The financial controller would have seen that the procurement manager was choosing to use Small Tools Ltd even though their prices are higher, so this would deter the procurement manager, thereby reducing the risk of the fraud.

(Evaluating accounting systems 1.4)

7. A A customised accounting system should meet all of Abeni's requirements as it has been written specially for her. An off the shelf software package is made for the mass market so is not customised to Abeni's specific requirements.

B is incorrect. Off the shelf packages are generally cheaper as the cost of developing them is recovered over many customers.

C is incorrect. Off the shelf software will have been tried and tested by other users so most processing errors (bugs) will already have been discovered and fixed. This is not the case with a customised system.

D is incorrect. All new systems should be tested.

(Evaluating accounting systems 2.1)

8. E Primary information is information collected for a specific purpose by the organisation using the data. Secondary data is information which is collected by somebody else, usually for another purpose but which can be adapted for the information needed.

Primary information is gathered by the organisation but may come from outside the organisation – for example, market research. So A is incorrect.

Primary data is more reliable because the organisation has collected the data itself. Answer B is therefore incorrect.

Primary information is usually more expensive as it has to be gathered specially for the organisation. Secondary information is often available publicly for a fee or even for free. C is therefore incorrect.

Information on websites would be classed as secondary.

(Principles of budgeting 1.2)

9. C RWF 54,250,000

The allocation and apportionment between the two departments is as follows:

	Department 1	Department 2	
Supervisors salaries	20,000,000	5,000,000	(direct allocation)
Maintenance costs	26,250,000*	8,750,000	(machine hours)
Light and heat	8,000,000**	4,000,000	(cubic metres)
Total indirect costs	<u>54,250,000</u>	<u>17,750,000</u>	

$$*30,000/40,000 \times \text{RWF}35,000,000 = \text{RWF}26,250,000$$

$$**400/600 \times \text{RWF}12,000,000 = \text{RWF}8,000,000$$

Answer A: Incorrectly ignores supervisors' salaries, but these are indirect costs.

Answer B: Both maintenance and light and heat are apportioned using cubic metres. Maintenance is more likely to depend on the number of machines, so machine hours reflects this better.

Answer D: Both maintenance and light and heat are apportioned using machine hours. Light and heat is more likely to depend on the area of the factory occupied by each department.

(Principles of budgeting 1.4)

10. B
- (i) This describes the decline phase of the product lifecycle, which comes after the maturity phase.
 - (ii) This is correct. The maturity phase follows the growth phase. Revenue growth slows down, but does not necessarily fall to zero.
 - (iii) This is incorrect. The product may be modified, but not totally redesigned during the maturity phase. A total redesign would start a new product lifecycle.
 - (iv) This is correct. Although sales growth is low, sales are high, so the product is likely to enjoy economies of scale, and expenditure on development and marketing and advertising will be lower.

(Principles of budgeting 2.4)

Section B - Suggested solutions

11. Sentwali's Souvenirs

Marking scheme

	Marks
Correct calculation of quarterly increase in trend based on historic data	2
Calculate correct trend figure for all four quarters	2
Calculate forecast sales for each quarter by adjusting the trend	2
Calculation of correct cost of sales and gross profit for the year	2
Calculation of wages costs for the year	1
Calculation of other costs for the year	1
Total marks for this section	10

Detailed suggested answer

Statement of profit and loss

	RWF'000	
Revenue	709,378	
Cost of sales	<u>394,099</u>	(Sales × (100 ÷ 180))
Gross profit	315,279	
Wages of assistant	60,000	(3 months × 20,000)
Other costs	<u>90,000</u>	(7,500 × 12)
Profit	<u>165,279</u>	

Note – Forecast revenues by quarter

	RWF'000
Quarter 1	142,331
Quarter 2	108,689
Quarter 3	167,692
Quarter 4	<u>290,666</u>
	<u>709,378</u>

Working 1 – increase in quarterly trend

Increase in quarterly trend, using change from 2019 Q4 to 2020 Q3 (three periods of increase)

$$= (89,856/52,000)^{1/3} - 1 = 20\%$$

Working 2 – calculation of quarterly trend

		RWF'000
2019	Q4	52,000
		$52,000 \times 120\%$
2020	Q1	= 62,400

		$62,400 \times 120\%$	
2020	Q2	=	74,880
		$74,880 \times 120\%$	
2020	Q3	=	89,856
		$89,856 \times 120\%$	
2020	Q4	=	107,827
		$107,827 \times 120\%$	
2021	Q1	=	129,392
		$129,392 \times 120\%$	
2021	Q2	=	155,270
		$155,270 \times 120\%$	
2021	Q3	=	186,324
		$186,324 \times 120\%$	
2021	Q4	=	223,589

Working 3 – application of seasonal factors to get final forecasts

	<i>Trend</i>	<i>Adjustment</i>	<i>Forecast</i>
	RWF'000	factor	RWF'000
Q1	129,392	110%	142,331
Q2	155,270	70%	108,689
Q3	186,324	90%	167,692
Q4	<u>223,589</u>	130%	<u>290,666</u>
Total			<u><u>709,378</u></u>

(Principles of budgeting 3.3)

12.

Marking scheme

	Marks
Include investment and redundancy in cash flows at time t0	1
Calculation of savings on material costs each year	1
Calculation of savings on labour costs	1
Calculation of total discounted cash flow each year	1
Calculation of NPV of project	1
Statement about acceptability of project based on NPV	1
For identifying the first non-financial factor	1
For explaining first non-financial factor	1
For identifying a second non-financial factor	1
For explaining the second non-financial factor	1
Total marks for this section	10

Detailed suggested answer

Calculation of net present value of relevant cash flows relating to investment

	Now	Year 1	Year 2	Year 3	Year 4
	RWF'000	RWF'000	RWF'000	RWF'000	RWF'000
Investment	(10,000)				

Redundancy	(400)				
Salary savings (W1)		2,400	2,400	2,400	2,400
Material cost savings (W2)		<u>1,500</u>	<u>1,575</u>	<u>1,654</u>	<u>1,736</u>
Total cash flows	(10,400)	3,900	3,975	4,054	4,136
Discount factor @ 12%	<u>1</u>	<u>0.893</u>	<u>0.797</u>	<u>0.712</u>	<u>0.636</u>
Present value of cash flows	<u>(10,400)</u>	<u>3,483</u>	<u>3,168</u>	<u>2,886</u>	<u>2,630</u>
Net present value	<u>1,767</u>				

Based on the net present value being positive, the machine should be acquired, as the return on the investment is higher than the 12% cost of financing it and it is therefore worthwhile.

While the project is beneficial from a financial perspective, other factors should also be considered before a final decision is made. The machine would lead to the redundancy of an employee, which may be against the ethical beliefs of the owner of Claudine's fashions. It may also lead to a bad feeling among the remaining employees who may feel that their colleague has been poorly treated, and may feel that their own jobs are under threat.

Forecasts are always subject to uncertainty, and should the forecasts turn out to be incorrect, the project may not actually provide a positive net present value. The forecast NPV itself is only 17% of the investment required now, including the redundancy, so it would not take a large failure of any of the benefits to materialise before the NPV is negative.

What impact would the machine have on the quality of the clothes? It may be that Claudine's fashion customers like having their clothes hand made, and may perceive a loss of quality if more of the processing is performed by a machine.

Workings

1 Salary savings

The redundancy of RWF400,000 represented two months' salary. Therefore, the employee was on a salary of RWF200,000 per month or RWF2,400,000 per year, which would be saved.

2 Materials cost savings

Year 1 budgeted material costs without the machine were RWF30 million. 5% of these would be saved, being RWF1.5 million. Since sales will increase by 5% per year, material costs will also increase by 5% per year, so the savings will increase by 5% each year compared to what would be paid if the machine is not acquired.

(Measuring financial performance 2.9)

Section C - Suggested solutions

13. North Regional Education Authority

Marking scheme

	Marks
(a) For each problem relating to measuring performance in public sector bodies:	
For identifying the problem (× 3 problems)	3
For developing the discussion of the problem (× 3 problems)	3
Total part (a) (up to 3 problems)	6
(b)	
For good explanation of economy	2
For good explanation of efficiency	2
For good explanation of effectiveness	2
Total part (b)	6
(c)	
Up to 2 marks for calculation of additional performance measures	2
Up to 2 marks for each valid well explained point on performance	8
Total part (c) (Maximum)	8
Total	<u>20</u>

Detailed solution

Part (a) Problems of performance measurement in public sector bodies

Public sector bodies such as schools do not have a profit motive so traditional financial performance measures such as revenue, profits and return on capital employed are meaningless. This means alternative measures of performance need to be used.

The lack of profit motive may also lead to public sector bodies being less efficient than commercial organisations. Commercial organisations will not survive if they are unprofitable, while the survival of public sector organisations depends on decisions made by governments, who may continue to fund organisations even if they are spending more than their budget.

Identifying the objectives of public sector bodies may be complicated by the fact that there may be many stakeholders with different views as to the objectives of the organisation. While the authority has identified the mission of the schools as preparing young Rwandans to make a positive impact on the work place, it is likely that they will have to balance this objective against financial constraints. Other stakeholders, such as

taxpayers may wish to reduce the amount spent on education. Some students may wish to have an excellent academic education for example, which may not prepare them particularly well for the work place. In order to measure performance, it is necessary to decide which of these objectives are the most appropriate, and measure performance against these.

Identifying output achieved can be difficult in public sector organisations due to the fact that different amounts of effort are needed each time an activity is performed. In schools, for example, teachers may need to spend more effort on less able pupils than on pupils with higher abilities, so simply counting the number of students that complete their education may not accurately reflect the work performed by the schools.

(Principles of managing financial performance 3.7)

Part (b) Economy, efficiency and effectiveness

Unlike commercial organisations, where income is related to the level of activity and sales, in not-for-profit organisations, income is determined externally. An organisation aims to maximise the effectiveness of their use of these limited funds. The 'value for money' framework can be used to assess the performance of not-for-profit organisations, using three headings: economy, efficiency and effectiveness.

Economy measures the cost of the inputs used by an organisation to ensure that they are not overpaying for the resources that they buy. In order to measure economy, a cost unit must be defined, and the cost per cost unit can be calculated. In a school, for example, the cost per teacher could be calculated, where the teacher is the cost unit, and the cost per teacher is calculated by dividing all costs of the school by the number of teachers.

Efficiency looks at the relationship between inputs and outputs. How many units of output is generated by each unit of input? In a school, the number of pupils per teacher could be used as a measure of efficiency, where schools that manage to educate more pupils per teacher are considered to be more efficient.

Effectiveness looks at how well the organisation achieves its main objective. In the case of the NRDEA, the main objective is to prepare young Rwandans to make a positive impact in the work place. This could be measured by using statistics such as the percentage of pupils who managed to obtain a job within six months of leaving school, or using exam results as a proxy measure for this.

(Principles of managing financial performance 3.8)

Part (c) Performance of the two schools

Economy

Economy can be measured by calculating the cost per pupil where the pupil is used as a cost unit, and all costs of running the school are divided by the number of pupils. Bee is performing better with a cost per pupil of RWF108,000 compared to RWF122,500 for Aye. This reduces the costs for the NRDEA and the taxpayer. This may be due to better financial management by Bee, but it may also be that costs of running a school in an urban location may be higher, due to higher rents, so this needs to be taken into account.

Efficiency

Efficiency can be measured as number of pupils per teacher, with a higher number of pupils being a sign that the school is using its limited resources to educate more pupils. Here Aye is performing better with 40 students per teacher compared to Bee with 33. Class sizes are also bigger in Aye, with 50 students per class compared to 30 for Bee. From an efficiency perspective, Bee is performing better although having a higher number of pupils per teacher may impact on the quality of education experienced by the pupils, and may therefore conflict with effectiveness.

Effectiveness

Several measures of effectiveness are available. The percentage of lower secondary pupils who move on to upper secondary is 58% in Aye compared to only 30% in Bee. The percentage of lower secondary pupils who move to technical and vocational training is 38% in Aye compared to 24% in Bee. This suggests that Aye is doing better in terms of getting its pupils prepared for the next stage in their education – in total 96% of students in Aye are continuing with education or training while only 54% of pupils in Bee are.

Conclusion

Although Bee appears to be the more economical of the two schools, it appears that Aye is spending its money more efficiently and effectively as it is educating more pupils per teacher, and more of its pupils leaving the lower secondary school are moving on to further education or training.

This analysis does not take account of potential differences between the environments within which the schools operate. It may be the case that being in a rural area, Bee has lower costs of rents which might have led to the favourable economy. People living in rural areas might also be required to work on family farms at the end of lower secondary, which may explain the lower numbers of pupils moving on to further education. These areas need to be investigated before reaching final conclusions.

Workings

	Aye	Bee
Cost per pupil	$\text{RWF}98 \text{ million}/800 =$ $\text{RWF}122,500$	$\text{RWF}54 \text{ million}/500 =$ $\text{RWF}108,000$
Students per teacher	$800/20 = 40$	$500/15 = 33$

(Principles of managing financial performance 3.3)

14. Great Coffee Farmers Association

Marking scheme

Marks

(a)		
	Calculation of materials price variance	2
	Calculation of materials usage variance	2
	Calculation of labour rate variance	2

Calculation of labour efficiency variance	2	
Total part (a)		8
(b)		
1 mark each for suggesting the cause of each variance	4	
For suggesting link between material usage and material price	1	
For suggesting link between labour efficiency and rate variance	1	
Discussion of responsibility of production manager for purchases	1	
Discussion of responsibility of production manager for labour performance	<u>1</u>	
Total part (b)		8
(c)		
Up to 2 marks for each point made	<u>4</u>	
Total part (c)		4
Total		20

Detailed solution***Part (a) Calculation of variances***

(i) Materials price variance

	RWF
240,000 kg cherries should have cost (× RWF225)	54,000,000
But did cost	48,000,000
Materials price variance	<u>6,000,000 (F)</u>

(ii) Materials usage variance

30,000kg should have used (× 7kg)	210,000 kg
But did use	240,000 kg
Variance Kgs	30,000 kg
Standard price per kg	<u>× RWF225</u>
Materials usage variance (RWF)	<u>6,750,000 (A)</u>

(iii) Labour rate variance

	RWF
50,000 hours should have cost (× RWF450)	22,500,000
But did cost	21,250,000
Labour rate variance	<u>1,250,000 (F)</u>

(iv) Labour efficiency variance

30,000kg should take (× 1.5 hours)	45,000 hours
But did take	50,000 hours
Variance (hours)	5,000
At standard cost per hour	<u>× RWF450</u>
Labour efficiency variance (RWF)	<u>2,250,000 (A)</u>

(Measuring financial performance 1.6)

Part (b) Performance of the production manager

The materials price variance is favourable, which is due to paying a lower price for lower quality cherries. This is due to the actions of the purchasing manager, who made a decision to pay a lower price. The production manager should not be judged on this.

The lower quality cherries meant that a lower yield was achieved, leading to an adverse materials usage variance. While this looks as if the production manager has performed poorly, he is not to blame for the poorer quality of the coffee cherries used, so allowance should be made for this. Overall, the total material variances are adverse (6,750,000 A – 6,000,000 F = 750,000 A) so the price paid was not reduced sufficiently to reflect the lower yield, leading to higher cost of RWF750,000 for materials.

The labour rate variance is favourable because the production manager bargained the wage rate down from 450 to 425 per hour. While cost savings are good, the effect of cutting wage rates is likely to be adverse as it could lead to demotivated staff, who may not work as efficiently.

The labour efficiency variance was adverse, which may be related to the lower wage rate. It may also be related to the lower grade of material, since a lower yield may have meant that more work was performed per kg of good beans than the standard. The total labour variance is RWF1,000,000 adverse (2,250,000 – 1,250,000) which does not reflect well. It seems that the decision to pay a lower wage rate may have actually led to a higher overall cost.

Overall therefore, the production manager has not performed well during his first month, given the labour variances.

(Measuring financial performance 1.6)

Part (c) Revision of standard

Since the performance of managers is judged by comparing their actual costs against a standard, it is only fair that the standard is achievable under normal operating conditions. Standards should be revised where it turns out that they are not achievable or if external factors, such as market prices, change in such a way as to make the standards out of date.

In the case of GCFA, there is no evidence to suggest that the standard is wrong. The material usage variance was caused by lower quality inputs, but hopefully this will be exceptional rather than the normal situation. While the production manager should not be 'blamed' for this variance, it does not mean that the standard should be revised.

The labour variances also appear to have been caused by internal factors rather than the standard itself being wrong. It would seem therefore that the manager wishes to change the standard to mask his performance, and this should not be allowed.

(Measuring financial performance 1.7)

15. The Big Technology Company

Marking scheme

		Marks
(a)		
	Material cost per unit	1
	Skilled labour per unit	1
	Variable overhead per hour using high low method	1
	Variable overhead per unit	1
	Total fixed overheads using high low method	2
	Total supervisors salaries	1
	Total depreciation	1
	Fixed overheads, supervisors salaries and depreciation per unit	<u>1</u>
	Total part (a)	9
(b)		
	Calculation of required return	1
	Calculation of target cost	1
	Calculation of cost gap	1
	Total part (b)	3
(c)		
	Objective of target costing (acceptable margin in competitive market)	1
	Explanation of what target cost is	2
	Explanation of target cost	2
	Explanation of value engineering to reduce costs	2
	Up to 2 marks for each practical suggestion for reducing cost gap	<u>4</u>
	Total part (c)	Max 8
	Total	<u>20</u>

Detailed solution

Part (a) Budgeted cost per unit

	RWF
Materials and components (5% discount applied: $20,000 \times 95\%$)	19,000
Skilled labour (0.5 hours \times 600)	300
Variable overheads (working 1)	2,500
Supervisors salaries (working 2)	480
Depreciation (working 3)	10,000
Other fixed overheads (working 1)	2,400
Total cost per unit	<u>34,680</u>

Working 1 – variable and fixed overheads

The overheads need to be ascertained from the previous year's overheads. The split between variable and fixed costs is calculated using the high low method, where October is the month with the lowest number of labour hours and December has the highest:

Variable overhead per labour hour = $\frac{100 \text{ million} - 70 \text{ million}}{16,000 - 10,000} = \text{RWF } 5,000$ per labour hour.

\Rightarrow variable overhead per unit = $0.5 \text{ hours} \times \text{RWF}5,000 = \text{RWF}2,500$

Fixed overheads = total overheads – variable overheads

Using December last year, total overheads = $100 \text{ million} - (16,000 \times \text{RWF}5,000) = \text{RWF}20 \text{ million}$ per month, $\text{RWF}240 \text{ million}$ per year.

\Rightarrow fixed costs per unit = $\text{RWF}2,400$ ($240 \text{ million} \div 100,000$)

Working 2 – supervisors salaries

Total skilled labour hours required per year = $100,000 \times 0.5 = 50,000$

Skilled hours per labourer per year = $40 \text{ per week} \times 48 \text{ weeks} = 1,920$

\Rightarrow number of labourers required = $50,000 \div 1,920 = 26$.

One supervisor can supervise up to 15 skilled labours \Rightarrow 2 supervisors required.

Total supervisors salaries = $\text{RWF}48 \text{ million}$ ($24 \text{ million} \times 2$)

\Rightarrow cost per unit = $\text{RWF}480$.

Working 3 – depreciation

Annual depreciation = $\text{RWF}1,000 \text{ million}$ ($4,000 \text{ million} \div 4 \text{ years}$)

Depreciation per unit = $\text{RWF}10,000$ ($1,000 \text{ million} \div 100,000 \text{ units}$)

(Principles of budgeting 3.4)

Part (b) Target cost per watch and cost gap

	RWF
Market price	38,000
Less: required profit per unit (working)	<u>(8,000)</u>
Target cost	30,000
Budgeted cost (part (a))	<u>34,680</u>
Cost gap	<u><u>4,680</u></u>

Note – the cost gap represents the extent to which the budgeted cost per unit exceeds the target cost.

Working

Required return on investment per year $\text{RWF } 800 \text{ million}$ ($20\% \times 4,000 \text{ million}$)

\Rightarrow return per unit = $\text{RWF}8,000$ ($800 \text{ million} \div 100,000$).

(Principles of managing financial performance 3.6)

Part (c) Explanation of target cost and ways to reduce cost gap

Target costing is an approach to achieving an acceptable margin in competitive markets, where a market price has to be accepted. The manufacturer cannot increase prices above the market price, so the only way to increase margins is to reduce costs. A target cost is a level of cost per unit that the business would like to achieve, and is calculated by deducting the required margin from the market price. In the case of the Big Technology Company, the target cost of the new smart watch was calculated in part (b) and was RWF30,000.

A cost gap is the amount by which the current or budgeted cost of the product exceeds the target cost. Target costing aims to identify ways to reduce the gap to zero. Several methods can be used.

Value engineering is an approach to cost reduction of new products. It involves looking at the material composition of the product and its design and identifying ways to reduce the cost without reducing the value to the customer.

In the case of the smart watch, the biggest costs are materials and components, which account for 55% of the cost per unit of the watch. It may be possible to reduce the cost of materials by negotiating bigger discounts, or identifying alternative suppliers who can offer a more favourable price. It may also be possible to use cheaper materials or components, but it is important that quality is not compromised.

Cost reduction often involves finding ways of increasing the efficiency of labour. In the case of the smart watch, labour costs are not a significant proportion of the cost of the watch, so it is unlikely that big reductions in costs could be made here.

(Principles of managing financial performance 3.6)