THE PUBLIC ACCOUNTANTS EXAMINATION

COUNCIL OF MALAWI

2013 EXAMINATIONS

ACCOUNTING TECHNICIAN PROGRAMME

PAPER TC9: COSTING AND BUDGETARY CONTROL

TUESDAY 3 DECEMBER 2013 **TIME ALLOWED : 3 HOURS**
9.00 AM - 12.00 NOON

SUGGESTED SOLUTIONS

1.   (a)   Margin of safety refers to the difference between budgeted output and the breakeven output calculated as sales volume (units) or value (sales revenue).

    (b) (i)   Variable cost per unit

		K
Material	4 kilos × K7.5	30
Labour	5 hours × K11	55
Production overhead	5 hours × K2.4	12
Sales overhead		5
		102

Fixed overhead costs:	K
Production	60,000
Administration	35,000
Sales	11,000
	106,000

Contribution per unit	K
Selling price	136
Less: Variable cost	102
	34

Break-even point $= \dfrac{\text{Fixed overhead}}{\text{Contribution per unit}} = \dfrac{K106{,}000}{34} = 3{,}118$ units

In Value $= 3{,}118 \times K136 = K424{,}048$

(ii) Margin of safety $=$ Sales $-$ Break-even point $= 8{,}000 - 3{,}118 = 4{,}882$ units

In Kwacha $= 4{,}882 \times K136 = K663{,}952$

(iii)		K
	Required profit	180,000
	Fixed costs	106,000
	Required contribution	286,000

Sales units $= \dfrac{\text{Required contribution}}{\text{Contribution per unit}} = \dfrac{286{,}000}{K34} = 8{,}412$ units

(c) (i)   Month 2 variable costs per unit

		K
Material	K30 × 105%	31.5
Labour	K55 × 104%	57.2
Production overhead	K12 × 110%	13.2k
Sales overhead	K5 × 110%	5.5
		107.4

Month 1 Contribution to Sales ratio:

$$\frac{\text{Contribution}}{\text{Sales}} \times 100\% = \frac{34}{136} \times 100 = 25\%$$

Therefore variable cost to sales = 75%

Month 2 variable costs = 75% × selling price = K107.4

Selling price per unit = $\frac{107.4}{75} \times 100$ = K143.2

(ii)   Month 2 fixed overhead   K

Production	60,000 × 103%	61,800
Administration	35,000 × 108%	37,800k
Sales	11,000 × 110%	12,100
		111,700

Fixed overhead   111,700

Break-even point = $\dfrac{}{\text{Contribution to sales ratio}}$ = $\dfrac{}{25\%}$ = K446,800

2.   (a)   (i)   Cost allocation is the charging of discrete identifiable items of cost to cost centres or cost units.

(ii)   Cost apportionment is the re-allocation of costs amongst two or more cost centres in proportion to the estimated benefit received, using a proxy, e.g. square feet.

(iii)   Cost absorption is the charging of overhead to cost units by means of rates separately calculated for each cost centre.

(b)

	Personnel and Administration (K'000)	Maintenance (K'000)	Stores (K'000)	Moulding (K'000)	Extrusion (K'000)	Finishing (K'000)
Materials	36	23		330	170	20
Labour	155	25	18.72	168.75	115.2	81
Variable overhead				71.25	151.8	30
Fixed overhead	15	15	17.28	449.30	371.7	67
	206	63	36	1019.3	808.7	198
Personnel	(206)			100.98	64.63	40.39
Maintenance		(63)		18	36	9
Stores			(36)	8	12	16
	_____	_____	_____	_____	_____	_____
Total cost	_____	_____	_____	1,146.28	921.33	263.39

Basis for apportionment:

Personnel and administration costs - number of employees
Maintenance costs - maintenance hours worked in each department
Stores costs - stores floor space.

(c)

	Personnel and Administration (K'000)	Maintenance (K'000)	Stores (K'000)	Moulding (K'000)	Extrusion (K'000)	Finishing (K'000)
Original Allocation	206	63	36	1019.3	808.7	198
Personnel Reallocation	(206)	14.21 (4/58)	10.65 (3/58)	88.79 (25/58)	56.83 (16/58)	35.52 (10/58)
Maintenance reallocation		(77.21)	13.63 (15/85)	18.19 (20/85	36.33 (40/85)	9.08 (10/85)
Stores reallocation			(60.28)	13.4 (20/90)	20.09 (30/90)	26.79 (40/90)
Total cost				1,139.66	921.95	269.39

(d) The reciprocal method incorporates all inter-servicing relationships.
  Let P =total cost of personnel and administration
    M =total cost of maintenance
    S =total cost of stores
The total costs that will be transferred to the service departments can be expressed as:
$P = 206 + 0.0556M (W1)$
$M = 63 + 0.0690P (W2) + 0.10 (W3)$
$S = 36 + 0.166M (W4) + 0.0517P (W5)$
The total costs of the production department will be:

Moulding (K'000) 1019.3 + 0.431P ($W6$) + 0.22M($W7$) + 0.2S ($W8$)
Extrusion (K'000) 808.7 + 0.276P ($W9$) + 0.44M($W10$) + 0.3S ($W11$)
Finishing (K'000) 198.0 + 0.172P ($W12$) + 0.11M($W13$) + 0.4S ($W14$)
Workings
($W1$)M coefficient = 5/90 ($W8$) S coefficient = 20/100
(W2) P coefficient = 4/58 ($W9$) P coefficient = 16/58
($W3$) S coefficient = 10/100 ($W10$) P coefficient = 40/90
($W4$)M coefficient = 15/90 ($W11$) S coefficient = 30/100
($W5$) P coefficient = 3/58 ($W12$) P coefficient = 10/58
($W6$) P coefficient = 25/58 ($W13$)M coefficient = 10/90
($W7$) M coefficient = 20/90 ($W14$) S coefficient = 40/100

3. (a) (i) Absorption costing does **not** underestimate the importance of fixed costs.

    (ii) It avoids the possibility of fictitious losses being reported.

    (iii) Fixed manufacturing overheads are essential to production and therefore should be incorporated in the product costs.

    (iv) Internal profit measurement should be consistent with absorption costing profit measurement that is used for external reporting requirements.

(b) Department A

(i) Budgeted direct labour hours = $\dfrac{K60,000}{K6}$ = 10,000 hours

(ii) Fixed overhead absorbed = 8,000 hours worked × K6 per hour = K48,000

(iii) Actual fixed overhead = Absorbed fixed overhead + Under absorbed
        = K48,000 + K8,000
        = K 56,000

(iv) Hours per unit = $\dfrac{\text{Budgeted hours}}{\text{Budgeted units}} = \dfrac{10,000}{5,000}$ = 2 hours per unit

    Standard hours = Actual production units x Hours per unit = 3,900 ×2
        = 7,800 standard hours

(v) Activity ratio = $\dfrac{\text{Standard hours produced}}{\text{Budgeted hours}} \times 100 \quad \dfrac{7,800}{10,000}$ = 78%

(vi) Capacity ratio = $\dfrac{\text{Actual hours}}{\text{Budgeted hours}} \times 100 \quad \dfrac{8,000}{10,000}$ = 80%

(viii) Efficiency ratio = $\dfrac{\text{Standard hours}}{\text{Actual hours}} \times 100 \quad \dfrac{7,800}{8,000}$ = 97.5%

(c) Department B

(i) Budgeted overhead absorption rate = $\dfrac{K50,000}{5,000}$ = K10 per hour

(ii) Actual hours worked = $\dfrac{\text{Absorbed overhead}}{\text{Absorption rate}}$ = $\dfrac{K55,000}{K10 \text{ per hour}}$ = 5,500 hours worked

(iii) Fixed overhead absorbed   K55,000
       Actual fixed overhead   K52,000
       Over absorbed   K3,000

(iv) Hours per unit = $\dfrac{\text{Budgeted hours}}{\text{Budgeted units}} = \dfrac{5,000}{1,000}$ = 5 hours per unit

    Standard hours = Actual production units x hours per unit = 1,120 x 5
        = 5,600 hours   )

4. (a) Integrated accounts refer to a set of accounting records which provide both financial and cost accounts using common input data for all accounting purposes whereas interlocking accounts refer to a set of accounting records where the cost and financial accounts are distinct, the two being kept continuously in agreement by the use of control accounts or reconciled by other means.

(b) (i) Raw material stock control a/c

	K		K
Balance b/f	72,640	Finished goods (W1)	608,400
Creditors	631,220	Balance c/f	95,280
	703,680		703,680

(ii) Production overhead control a/c

	K		K
Bank (creditors)	549,630	Finished goods (W1)	734,000
Wages (W2)	192,970	P & L (under-absorption)	8,600 (W4)
	742,600		742,600

(iii) Finished goods stock control a/c

	K		K
Balance b/f (80,640+102,920)	183,560	Production cost of sales (W6)	1,887,200
Raw materials	608,400	Balance c/f	225,960
Wages (W5)	587,200		
Production overhead	734,000		
	2,113,160		2,113,160

Workings:

1. Raw materials issues:
   Product A: 41,000 units at K7.20 per unit = K295,200
   Product B: 27,000 units at K11.60 per unit = K313,200
   K608,400

2. Indirect labour charged to production overhead:
   3,250 overtime premium hours at K2 per hour=K6,500+K186,470 = K192,970

3. Production overhead absorbed charged to finished goods:
   Product A: 41,000x1 hour x K10 = K410,000
   Product B: 27,000 x 1.2 hrs x K10 = K324,000
   K734,000

4. Production o/h under-absorbed =K549,630+K192,970-K734,000

$$= \underline{K8,600}$$

5 Direct labour charge to finished goods stock:

Product A:41,000x 1 x K8	=	K328,000
Product B: 27,000 x 1.2 x K8	=	K259,200
		K587,200

6 Production cost of sales:

	Product A	Product B
Materials	7.20	11.60
Direct labour	8.0	9.60 (1.2xK8)
Overhead	10	12.0(1.2xK10)
Unit Cost	25.2	33.20

Cost of sales: Product A = 38,000 units x K25.20	=	K957,600	
Product B= 28,000 units x K33.20	=	K929,600	
		K1,887,200	

(c)

	Product A		Product B	Totals
	K'000		K'000	K'000
Sales (38,000 x35)	1,330	(28,000x 39)	1,092	2,422
Production cost of sales	(957.6)		(929.6)	(1,887.2)
Gross profit	372.4		162.4	534.8
Under-absorbed production o/h				(8.6)
Non production overheads				(394.7)
Net profit				131.5

5.   (a)   As a by-product has a commercial value, the income earned from the sale of a by product may be recognized in different ways: it may be added to the sales from the main product, treated as a separate incidental source of income, deducted from the production cost of sales of the main product or deducting the net realizable value of the by-product from the production cost of the main product.

(b)   (i)

Main Process (Process 1) Account

	kg	K		kg	K
Materials	10,000	15,000	P finished goods	4,800	16,390
Direct labour	-	10,000	Q Process 2	3,600	17,210
Variable overhead		4,000	By product R	1,000	1,750
Fixed overhead		6,000	Normal toxic waste	500	-
Toxic waste disposal		750	Abnormal toxic waste	100	400
	10,000	35,750		10,000	35,750

Workings:

Normal loss (toxic waste) = 50 kg per 1,000 kg of input (i.e. 5%)

Actual input = 10,000 kg

Abnormal loss = actual toxic waste (600 kg) less normal loss (500 kg) = 100 kg

By-product R net revenues of K1,750 are credited to the joint (main) process account and normal and abnormal losses are valued at the average cost per unit of output as follows:

$$\text{Net cost of production} \frac{(K35,750 - K1,750)}{\text{Expected output}(8,500 \text{ kg})} = K4 \text{ per unit}$$

The cost of the output of the joint products is K33,600 (8,400kg x K4) and this is to be allocated to the individual products on the basis of final sales value (i.e. 4,800 kg x K5 = K24,000 for P and 3,600 kg x K7 = K25,200 for Q).

P = K24,000/K49,200 x K33,600 = K16,390

Q=K25,200/K49,200 x K33,600 = K17,210

(ii)   Toxic waste disposal a/c

	K		K
		Main process a/c	750
Bank	900	Abnormal toxic waste	150 (100 x 1.5)
	900		900

(iii)   Abnormal toxic waste a/c

	K		K
Main process a/c	400	P & L	550
Toxic waste disposal	150		
	550		550

(iv)   Process 2 account

	Kg	K		Kg	K
Main process Q	3,600	17,210	Finished goods Q(W2)	3,300	26,465
Fixed costs		6,000	Closing WIP (W2)	300	1,920
Variable costs (W1)		5,175			
	3,600	28,385		3,600	28,385

Workings

W 1: [3,300+(50% x 300)] x K1.50 = K5,175

W2: WIP		Complete units	WIP eqiv. units	Total equiv. units	Cost per unit
Previous process cost	K17,210	3,300	300	3,600	4.78
Conversion cost(6,000+5,175) K11,175		3,300	150	3,450	3.24
					8.02

	K
Completed units (3,300 x 8.02)	26,465
WIP (300 x K4.78)+(150 x 3.24)	1,920
	28,385

6. (a) (i) A limiting factor of production is anything that limits the activity of a business. It may be sales demand, or shortage of a resource such as material or labour.

   If a business is seeking to maximise profit, the scarce resource should be allocated to the products according to the contribution that each product makes per unit of scarce resource.

   (ii) The limiting factor is machine hours (direct labour/direct labour hours).

   (b) Since machine hours are the limiting factor, profits will be maximized by allocating machine hours on the basis of a product's contribution per machine hour. In order to do this, it is necessary to compute the output per machine hour for each product.

   Output per machine hour = K427,500/2,250 hrs

   = K190 per machine hour

   Output per machine hour = $\frac{\text{machine hour rate}}{\text{overhead allocated per unit of output}}$

   W = (K190/K0.855)222.2 units per hour
   X = (K190/K0.950) 200 units per hour
   Y = (K190/K0.475) 400 units per hour
   Z = (K190/K0.76) 250 units per hour

Contribution per machine hour

	Product			
	W	X	Y	Z
	(K)	(K)	(K)	(K)
Selling price per unit	3.650	3.900	2.250	2.950
Variable costs per unit	1.865	2.110	1.272	1.589
Contribution per unit	1.785	1.790	0.978	1.361
Output per machine hour (units)	222.2	200	400	250
Contribution per machine hour (K)	396.6	358	391.2	340.25
Ranking	1	3	2	4

Required machine hours to meet the maximum demand

Hrs	Qty(units)
W= 855hours (190, 000/222.2)	190,000
Y= 360hours (144, 000/400)	144,000
X= 625hours (125, 000/200)	125,000
Z= 568hours (142, 000/250)	102,500 [(2,250– 855-625-360)x250]
2,408 hours	

Practical capacity 2,250 hours
Shortfall   158 hours

(c) *Calculation of profits with overtime*

	Product				Total
	W	X	Y	Z	(K)
Sales volume (units)	190,000	125,000	144,000	142,000	
Contribution per unit (K)	1.785	1.790	0.978	1.361	
Total contribution	339,150	223,750	140,832	193,262	896,994
Less overtime premium(W1)					(10,053)
					886,941
Less fixed costs:					
Manufacturing					(427,500)
Selling and administration					(190,000)
Additional					(24,570)
Net profit					244,871

W1
The production shortfall of 158 machine hours could be made up by working overtime on any of the four products.

The direct labour cost per machine hour for each product is:

W= K134.20 (222.2 x K0.604)
X = K130.20 (200 x K0.651)

Y = K162 (400 x K0.405)
Z = K127.25 (250 x K0.509)

Therefore it is cheaper to work overtime on product Z.
The overtime premium will be 158 x 250 x (K0.509 x0.5) = K10,053.

7. (a) The Fixed Overhead Volume Variance can be broken down into the Capacity Variance and the Efficiency Variance.

The Capacity Variance is caused by an increase or decrease in the actual hours worked compared to the budgeted hours for the period, calculated at the standard absorption rate per hour.

The Efficiency Variance is caused by an increase or decrease in the actual hours taken to make the actual units of output compared with the standard hours allowed, calculated at the standard absorption rate per hour.

(b) A cost centre is 'a production or service location, function, activity or item of equipment for which costs are accumulated'.

A cost unit is 'a unit of product or service in relation to which costs are ascertained'.

(c) (i) Ideal standard – this can be attained only under favorable conditions with no allowance for normal losses, waste and machine or labour downtime.

(ii) Attainable standard – this is one which can be attained if a standard unit of work is carried out efficiently. Allowances are made for normal losses, waste and acceptable machine and labour downtime.

(iii) Basic standard – a standard established for use over a longer period of time. It remains fixed for a long period of time.

(iv) Current standard – a standard that represents costs and efficiencies that are currently being achieved. It perpetuates any inefficiencies there may be in the production process.

(d) (i) An individual bonus scheme is a remuneration scheme whereby individual employees qualify for a bonus on top of their basic wage, with each person's bonus being calculated separately.

(ii) A group bonus scheme is an incentive plan which is related to the output performance of an entire group of workers, a department or even the whole factory

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