



MAC3701

October/November 2014

APPLICATION OF MANAGEMENT ACCOUNTING TECHNIQUES

Duration 2 Hours

100 Marks

 EXAMINATION PANEL AS APPOINTED BY THE DEPARTMENT

Use of a non-programmable pocket calculator is permissible

Closed book examination

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This paper consists of 8 pages (including this page)

PLEASE NOTE:

- 1 All questions must be answered and calculations must be shown
- 2 Ensure that you are handed the correct examination script (blue) by the invigilator
- 3 Each question attempted must be commenced on a separate page
- 4 You may not write with a pencil or a red pen
- 5 Ignore taxation and the time value of money, except when specifically stated otherwise
- 6 A combined final mark of 50% is required to pass this module. This final mark is calculated as follows: (mark out of 10% obtained for compulsory assignments 01, 02 and 03) + (90% x mark obtained in this examination), subject to a subminimum of 40% for this paper

PROPOSED TIMETABLE

Question	Topic	Marks	Minutes
1	Activity-based costing	15	18
2	Economic order quantity, Joint- and byproducts, Relevant costing, Learning Curve, Linear programming	35	42
3	Budgeting	12	14
4	Transfer pricing & Performance measurement	10	12
5	Standard costing & Break-even analysis	28	34
		100	120

QUESTION 1 (15 marks; 18 minutes)

Get Fit Ltd is a popular new company which manufactures wireless activity wristbands. They have been manufacturing three different types of wireless devices that track steps, distance and calories burned. There is an increasing demand for these devices as it claims to make fitness fun and keep people motivated as they can see real-time statistics of their progress. Currently Get Fit Ltd uses the traditional absorption costing system whereby they allocate their manufacturing overheads based on machine hours.

The following sales and costing information has been extracted from the 2014 budget:

<i>Product type</i>	<i>Fit Steps</i>	<i>Fit Distance</i>	<i>Fit Calories</i>	<i>Total</i>
Sales	R 1 600 000	R 4 750 000	R 3 560 000	R 9 910 000
Direct material cost	R 668 500	R 800 950	R 780 000	R 2 249 450
Direct labour cost	R 589 230	R 344 300	R 674 470	R 1 608 000
Marginal income before manufacturing overheads	R 342 270	R 3 604 750	R 2 105 530	R 6 052 550
Manufacturing overheads				R 4 000 000

The newly appointed cost accountant knows that the traditional costing system relies on arbitrary allocation of indirect cost and that it could provide misleading information for decision-making. She advised management to rather make use of activity-based costing (ABC) techniques to assign the manufacturing overheads.

As a result of the advice given to management, the manufacturing overheads were further analysed and the following activities and cost drivers were identified:

<i>Activity</i>	<i>Cost driver</i>	<i>Manufacturing overhead costs</i>
Machining	Machine hours	R 1 510 000
Set up	Number of set ups	R 560 000
Inspection	Number of inspections	R 900 000
Stores issue	Number of store issues	R 390 000
Stores receiving	Number of deliveries	R 640 000
		<u>R 4 000 000</u>

The budget for the 2014 year also contains the following total production information:

<i>Product type</i>	<i>Fit Steps</i>	<i>Fit Distance</i>	<i>Fit Calories</i>
Production/Sales volume (units)	2 000	5 000	4 000
Wireless devices (units) per production run	200	250	400
Inspections per production run	5	3	4
Machine hours per wireless device	10	8	5
Number of issues from stores	500	100	400
Number of material deliveries	15	50	35

The machines are set up once for each new production run.

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REQUIRED.

- a) **Calculate** the total budgeted manufacturing overheads allocated per product type if the traditional absorption costing system is used, and **[3]**
- b) **Calculate** the total gross profit for each product type using the proposed activity-based costing (ABC) technique to assign budgeted manufacturing overheads. The total column is not required **[10]**
- c) **Interpret** the difference between the total budgeted manufacturing overheads allocated for the Fit Steps product type only if the traditional absorption costing system is used and the total budgeted manufacturing overheads allocated for the Fit Steps product type if the activity-based costing (ABC) technique is used **[2]**

Note Round your amounts to three decimals

QUESTION 2 (34 marks; 41 minutes)**PART A (Economic order quantity and relevant costing) (11 marks, 13 minutes)**

Toyz (Pty) Ltd is a distributor of battery operated toy cars for children under the age of five years. The cars are so popular that the company has at times struggled to meet the demand. The average annual sales for these cars is 12 000 units and the sales are distributed evenly throughout the year based on 345 operating days per annum.

The following additional information is available for these cars:

Safety Stock*	250 cars
Lead time	5 days
Inventory holding cost	R18 per car per annum
Purchase price	R120 per car
Cost of capital (after tax)	10%
Ordering cost (irrespective of supplier)	R200 per order

*Assume that safety stock will be maintained throughout the period.

A supplier in the Middle East has offered Toyz (Pty) Ltd a price of R100 per car irrespective of the exchange rate provided it purchases 12 orders of 1 000 cars per order (resulting in an order being placed each month). Management will no longer hold any safety stock if this offer is accepted. Should the offer be accepted, inventory holding cost will increase from R13 500 per annum to R15 000 per annum. Import duties not refundable by SARS will be R19 000 per order.

REQUIRED:

- a) **Calculate** the economic order quantity of Toyz (Pty) Ltd. Ignore the new offer **[3]**
- b) **Calculate** the re-order point for the cars if the safety stock is maintained at 250 cars **[2]**
- c) **Advise** the management of Toyz (Pty) Ltd whether they should accept the price offered by the Middle East supplier **[6]**

Note Round your answers to the nearest unit

[TURN OVER]

PART B (Joint and by-products and relevant costing) (12 marks; 15 minutes)

Tshinwa (Pty) Ltd is a manufacturer of paper products. The company operates a process where two joint products and a by-product are manufactured. The joint products are newspaper printing paper and cardboard box making paper and the by-product is pulp. There was no opening inventory on 1 March 2014.

The following information relates to the month of March 2014 (which represents a typical month)

	Production	Tonnes sold	Selling price per tonne at split-off point
News printing paper	700 tonnes	600	R10 000
Cardboard box making paper	800 tonnes	700	R12 000
Pulp	200 tonnes	200	R 1 500

The following costs were incurred in March 2014

Raw materials	R800 000
Manufacturing labour	R200 000
Manufacturing overheads	R300 000
Insurance – administrative building	R 20 000
Head office security officer salary	R 15 000
Depreciation – head office building	R 12 000
Administrative overheads	R300 000

Joint costs are allocated on the basis of sales value at split off point. The company policy is to allocate net proceeds from the sale of by-products to joint costs.

Pulp can be processed further after split off point and sold at R2 000 per tonne. To accomplish this, the company will have to rent new machinery at a cost of R3 000 per month. The machine will have to be insured at R700 per month. Manufacturing labour costs will be R25 000 per month and raw materials will be R20 000 per month for this alternative.

REQUIRED:

- Calculate** the total value of closing inventory for the month of March 2014 if pulp is not processed further. **[8]**
- Determine** whether the company should further process the pulp. **[4]**

PART C (Learning curve) (7 marks; 8 minutes)

Asuz (Pty) Ltd is a manufacturer of touch screen laptops. The company has started manufacturing its latest 11 inch screen detachable notebook. The company has manufactured two of these laptops to date and sold them to XYZ Ltd. ABC (Pty) Ltd placed an order for 14 of these laptops.

The total variable manufacturing costs for the first two laptops were as follows

Direct labour R500 per hour	R2 880
Direct materials	R3 000
Manufacturing overheads	
- Variable	R 700
- Fixed	R1 000

The total direct labour hours to manufacture the first laptop was 3 hours. It is expected that the learning curve will be maintained for the manufacturing of the first 16 laptops.

[TURN OVER]

REQUIRED.

- a) **Calculate** the learning curve for the manufacturer of the touch screen detachable laptops [4]
- b) Assume the learning curve is 96% **Calculate** the total number of hours required to complete the 14 laptops ordered by ABC (Pty) Ltd [3]

PART D (Linear Programming) (5 marks; 6 minutes)

The manager of Big Bargains (Pty) Ltd is currently applying linear programming techniques to determine how to apply the scarce resources available to the company

He calculated that manufacturing and selling 550 units of the company's Bargain-O product and 350 of their Bargain-E product will maximise profits under the constraints experienced for a given period. One of the constraints involves a raw material type being limited to total of 90 000 kg for the given period. Each kilogram of this material costs R20 and the material is used in both products.

Contribution per unit is currently as follows

Bargain-O	R30
Bargain-E	R50

The manager has found another supplier of the material who sells the material at R8 per kilogram more than the current supplier. Having one additional kilogram of the material available will change the optimal production output to 552 units of Bargain-O and 349 units of Bargain-E.

REQUIRED:

- a) **Define** the term "shadow price" [2]
- b) **Determine** whether Big Bargains (Pty) Ltd should buy the additional kilogram of material at R8 [3]

QUESTION 3 (12 marks; 14 minutes)

A new company, Company X, plans to produce and sell Product X. It is expected that the production for the first three months of the 2014 budget year will be 16 000 units.

Each unit of Product X uses 3,2kg of material.

As a newly formed company, the company does not have any opening raw material inventory on hand at the start of the 2014 budget year and the company does not expect to have any closing inventory on hand at the end of the first three months.

The budgeted material cost is R25 per kg for the first 30 000kg cumulative purchases in a year. When cumulative purchases in a year are between 30 001kg and 50 000kg, the kilograms above 30 000kg will be purchased at R23 per kg. The excess of accumulated purchases over 50 000kg in a year will be at a cost of R21 per kg.

Company X produces Product X in batches of 4 000 units. In the production of the 16 000 units that will be produced in the first three months of the 2014 budget year, it is expected that the first 4 000 units will require 950 hours of skilled labour. The cumulative average after the production of the second batch of 4 000 units is expected to be 912 hours of skilled labour. This learning curve is expected to apply throughout the year [based on batches of 4 000 units]. The skilled labour hour rate is R450 per hour.

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Product X also requires unskilled labour. No learning curve is expected for unskilled labour. Each unit of Product X requires 1 unskilled labour hour at an unskilled labour hour rate of R30 per hour.

The budgeted variable manufacturing overhead recovery rate is set at R16 per direct skilled labour hour.

REQUIRED

- a) **Prepare** the direct material purchases budget of Company X for the first three months [4]
- b) **Prepare** the direct labour budget of Company X for the first three months [5]
- c) Assume that 3 502,08 direct skilled labour hours will be required in the production of Product X for the first three months of 2014. **Calculate** the amount of variable manufacturing overheads that should be budgeted for in this period [1]
- d) **Evaluate** whether each of the following statements regarding budgets are true/false
 - i Depreciation will not be a line-item in a cash budget [1]
 - ii Zero-based budgeting takes the view that projected expenses start from zero and is the best budget tool to use when dealing with discretionary costs [1]

QUESTION 4 (10 marks; 12 minutes)

Gamma Ltd has two divisions: the Alpha Division and the Beta Division. The Alpha Division manufactures a component that the Beta Division needs for a product that is manufactured by the Beta Division. The following information is available about the component that the Alpha Division manufactures:

Sales price	R170 per unit
Variable manufacturing costs	R80 per unit
Fixed manufacturing overhead	R60 per unit
Expected sales in units	55 000 units

There are no capacity constraints and all fixed costs are unavoidable in the short run. The Beta Division needs 5 000 units of the component for a product it manufactures.

The pre-tax operating profit for the Alpha Division is R1,55 million. The Net Book Value (NBV) of the assets of the Alpha Division is R5 million. The required divisional cost of capital is 12% per annum.

REQUIRED:

- a) **Determine** the minimum transfer price that the selling ("transferring") division would be willing to accept [1]
- b) **Determine** the maximum transfer price that the buying ("receiving") division would be willing to pay [1]
- c) Assume the transfer price is set at R90 per unit. **Determine** whether the manager of the Alpha Division will want to produce the components and sell them to the Beta Division [1]

[TURN OVER]

REQUIRED (continued)

- d) If the Beta Division takes these units at a transfer price of R90 per unit, incurs another R80 variable cost per unit and absorbs R40 fixed cost per unit, would the manager of the Beta Division be happy if the selling price for the product he manufactures is set at R190 per unit? [2]
- e) If the Alpha Division did not have any excess capacity, what would the correct transfer price be? [1]
- f) **Calculate** the residual income of Division Alpha [2]
- g) After consideration of the viability of the prices above, the manager of the Alpha Division discovered that the components contain hazardous substances that are harmful to young children. Currently the component is used in the production of a product that is regarded as safe for babies. How does this affect your decision in (c) above? Give a reason for your answer [2]

QUESTION 5 (28 marks, 34 minutes)

Blue Bags (Pty) Ltd manufactures and sells two types of bags: Handbags and Sporty Bags. The company uses a direct (variable) standard costing system. There was no inventory on hand on 1 April 2014.

The following information relates to the six month-period that ended on 30 September 2014.

1 Sales and variable data

	Handbags	Sporty Bags
Number of bags manufactured and sold		
Budgeted (units)	1 000	250
Actual (units)	900	300
Standard selling price per bag	R430	R560
Actual total sales value	R405 000	R145 800
Standard variable manufacturing cost per bag*	R180	R200
Actual material purchased and used (R32 per metre)	R51 840	R18 240
Budgeted variable selling costs	R12 000	R2 375

*Included in the standard variable manufacturing costs per bag, are the following raw material standards

	Handbags	Sporty Bags
Standard material cost per bag (R36 per metre)	R54	R72

[TURN OVER]

2 Fixed costs

- Rental of an administrative building (unavoidable for the next five years) R13 500 per month
- Budgeted fixed manufacturing costs amounting to R65 000 in total for the six-month period (used to calculate a budgeted company-wide overhead recovery rate based on production units, unavoidable unless the company no longer manufactures any products)

REQUIRED.

- a) **Calculate** the following based on the above variable costing system
- i Sales margin mix variance for the six month-period [6]
 - ii Sales margin volume variance for the six month-period [4]
 - iii Material purchase price variance for the six month-period [2]
- b) **Explain** how the use of absorption costing instead of direct costing would affect the sales margin mix variance. Include **calculations** in your explanation [8]
- c) **Calculate** the following based on **budgeted** figures
- i Total budgeted breakeven sales value of the company for the six month-period [5]
 - ii Budgeted breakeven sales quantity for the handbags product for the six month-period based on the following assumption: on 31 March 2014 the sporty bag product line was discontinued and the standard material purchase price per metre was adjusted downward by 10% [3]