Tutorial Letter 102/3/2015

APPLICATION OF MANAGEMENT ACCOUNTING TECHNIQUES

MAC3701

SEMESTER 1 and 2

Department of Management Accounting

This tutorial letter contains important
information about your module.

Dear Student

This tutorial letter contains additional practice questions (**not** to be seen as an indication of the topics that will be asked in the exam). It is in your own interest to attempt the questions as if in an exam setting and thereafter to work through the suggested solution in conjunction with the questions and your own answer.

Kind regards,

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BAR CODE

LECTURERS: **MAC3701**

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QUESTION BANK:

Module MAC3701 was available for the first time during 2014. This question bank was compiled from the questions in the 2014 assignments and the 2014 examinations and it's in your own best interest to work through these questions.

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2014 Examinations :	
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October/November 2014 examination *(Question paper available on MyUnisa)*	Annexure B

1.   ADDITIONAL QUESTIONS

Question 1:

Abelia (Pty) Ltd is a wholesaler of sporting equipment. The business sells approximately 8 500 tennis rackets per annum. Sales are evenly distributed throughout the year, and the business is operational for 330 days per annum.

Additional information:

Purchase price	R450
Order costs	R175
Lead time	6 days
Cost of capital (after taxation)	20%
Direct inventory holding costs	R25

Required:

a) Calculate the economic order quantity for the tennis rackets.
b) Calculate the re-order point for the tennis rackets if 30 tennis rackets are kept as safety inventory.

Question 2:

Birch Ltd has just started manufacturing 10-seater dining tables with chairs, and to date has manufactured and sold four of these sets. Cedar PLC, a wholesaler, is interested in purchasing 12 of these dining tables and chairs sets and would like a quote from Birch Ltd.

The variable manufacturing costs for the first four dining table and chairs sets was as follows:

	R
Direct labour at R50 per labour hour	15 360
Direct material costs	23 210
Overheads (variable at 40% direct labour hours, and 60% raw material costs)	22 000

Additional information:

1.   The total direct labour hours to manufacture the first set were 120 hours, and the total direct labour hours to manufacture the first two sets were 192 hours.
2.   Fixed production overheads solely for the manufacture of the first 32 sets amount to R64 000.
3.   Organisational overheads of the enterprise are to be apportioned at a rate of 5% of direct labour costs.
4.   Raw material costs have increased by 10% since the first four sets were produced.
5.   It is expected that the learning rate will be maintained for the manufacture of the first 32 sets.

In general, hours must be rounded off to 3 decimals. Final hours must, however, be rounded off to the nearest hour. All other calculations must be rounded off to the nearest rand or unit.

Required:

a) Calculate the learning curve.

Take note: If you express the learning curve as a **decimal**, it is referred to as a learning **rate**. If a question asks you to calculate a learning curve, your answer should be expressed as a **percentage**.

b) Calculate the time required to manufacture 12 dining table and chair sets.

> Please note that this question refers to the 12 dining table and chair sets that Cedar Plc is interested in buying (being the 12 sets that will be manufactured after the first 4 sets).

c) Calculate the minimum selling price that the company can quote for the 12 sets in order to recover the **relevant costs** and earn a profit of 25% based on the cost price.

Question 3:

Dogwood Manufacturers process a single product into 2 separate products, Ebony and Fir. Both products can be sold at the split-off point, product Ebony at R12 per kilogram and product Fir at R6 per kilogram. During January 2014 15 000 kilograms of input was used to produce 6 000 kilograms of Ebony and 9 000 kg of Fir. The joint cost of the input was R52 500.

Required:

a) Calculate the joint cost allocated to product Ebony and product Fir according to the physical measure method.
b) Calculate the joint cost allocated to product Ebony and product Fir according to the sales value at split-off point method. Round the proportion of each product's sales value to sales value total to 1 decimal.

Question 4:

Consider the validity of the following statements with regard to cost systems:

1.	Both traditional and ABC systems assign indirect costs to cost objects.
2.	Volume-based cost drivers assume that a product's consumption of overhead resources is directly related to units produced.
3.	A traditional costing system allocates overheads to production and service departments in the second stage of a two-stage process.
4.	The disadvantage of direct costing systems is that systems are not in place to measure and assign indirect costs to cost objects.

Required:

Indicate which of the above statements are **true.**

Question 5:

Redbay CC manufactures cardboard boxes in a single process. Material is added at the beginning of the process and conversion costs are incurred uniformly throughout the process.

Cost and production information for February 2014 is as follows:

	R	Units
Work in process: 1 February (40% completed)	19 689	12 000
Material	16 230	
Conversion costs	3 459	
Material added in February	101 745	90 000
Conversion costs in February	19 041	
Completed and transferred to finished products		79 200
WIP: 28 February (75% completed)		15 000

Additional information:

1.   The weighted average method is used for inventory valuations.
2.   Normal wastage is 5% of input that reach the wastage point and there were 7 800 wasted units.
3.   Wastage occurs at the end of the process.

Required:

    a) Calculate the abnormal loss for February.
    b) Calculate the equivalent cost per unit in terms of material.

Question 6:

Alpha Limited manufactures a single product.

You are provided with the following information regarding the standard cost per unit:

		R
Material Beta	3 kg @ R10 per kg	30
Material Gamma	9 kg @ R15 per Kg	135
Labour	6 clock hours @ R12	72
Fixed overheads		58
Variable overheads		30
		325

Alpha Limited makes a 10% allowance for idle time.

Actual information for January 2014:

1.   Number of units produced: 5 000
2.   Materials:

Purchased	Beta:	20 000 kg for R209 000
	Gamma:	54 000 kg for R756 000
Issued	Beta:	18 500 kg
	Gamma:	45 500 kg

3.   Labour cost: R294 000 for 30 000 hours clocked. Work hours amounted to 27 600.

Required:

    a) Refer activity 7.4 Page 121 MO 001/2015.   (13)
    b) Calculate the labour rate, idle time and efficiency variance.   (9)

Question 7:

Define divisionalisation and discuss the advantages and disadvantages thereof.   (10)

Question 8:

Medix Limited, a pharmaceutical company based in Gauteng is currently reviewing a research project involving a new anti-retroviral drug which to date has cost the company R750 000. Should the project be allowed to proceed, it is anticipated that it would take a period of 12 months to complete after which the results would be sold to a public entity for R1 000 000.

The managing director has provided you with the following expenses that are deemed necessary in order to complete the project:

1.   Material X R120 000

This material has recently been delivered. There is no other use for this material other than this research project. It would cost an estimated R8 000 to dispose of.

2.   Material Y R75 000

This material is in stock and used frequently by the company. The purchase price for this material has risen by 6% since the previous purchase.

3.   Skilled labour R300 000

These labour costs relate to workers that will be transferred to this project from another project. Extra labour will need to be recruited to the other project at a cost of R320 000.

4.   Research staff R200 000

A decision has already been taken that this will be the last major piece of research undertaken, and consequently, when work on the project ceases, the staff involved will be made redundant. Redundancy and severance pay has been estimated at R100 000.

5.   General building expenses R60 000

This expense represents a general expense that is allocated annually by the accounts department to each department.

Required:

Advise the managing director on whether or not the research project should be completed. Your answer should include calculations of relevant costs and income as well as explanations as to each item excluded in the calculations.   (10)

Question 9:

Use the information as contained in your Drury text book, IM25.1 (8th or 9th Edition).

Required:

Calculate the product mix that will maximise profit.   (22)

Question 10:

Statement of comprehensive and other income of Mango (Pty) Ltd for the year ended 28 February 2014

	R
Sales (90 000 units)	900 000
Less: Cost of sales	561 000
Direct material	135 000
Direct labour	270 000
Manufacturing overheads	
- Variable	36 000
- Fixed	120 000
Gross profit	339 000
Less: Operating expenses	364 000
Selling expenses	
- Variable (sales commission)	90 000
- Fixed	134 000
- Advertising	50 000
- Salaries	84 000
Administrative expenses (fixed)	140 000
Net loss	**25 000**

It has been established that sales can be influenced by increasing or decreasing the amount spent on advertising.

Required:

a) Calculate the break even sales in units.
b) Calculate the amount by which advertising can be increased in order to increase the sales volume from 90 000 units to 150 000 units, and to make a simultaneous profit of 5%, based on turnover.

Question 11:

Optispec Limited manufactures spectacle frames. The following information relates to January 2014:

Products	Budgeted sales in units	Budgeted production cost per unit	Budgeted selling price per unit	Actual sales in units	Actual sales revenue
SpecWise	700	R1 200	R1 800	650	R1 131 000
EyeWizz	300	R3 500	R5 250	500	R2 490 000

Required:

a) Calculate the sales mix variance, for the purpose of reconciling sales, based on sales revenue. (Round all calculations to the nearest rand and nearest complete unit)
b) Calculate the sales price variance.

Question 12:

Branjo Limited produces joint products Bran and Jo with by-product Li. The following information applies:

	Production (tons)	Sales (tons)	Selling price per ton
Product Bran	1 200	1 200	R80
Product Jo	800		
Product Li	500	500	R50

Additional information:

1. Raw materials of R45 000 and conversion costs of R55 000 make up the joint costs.
2. Product Li can be further processed at a cost of R15 000.
3. There was no opening or closing inventory.
4. Assume that the joint product is sold for cash and not on credit.

Required:

a) What would the journal entry be for the sale of the by-product Li?
b) Which one of the following statements is **true?**
   1) The joint costs allocated to products Bran and Jo will be R115 000.
   2) The joint costs allocated to products Bran and Jo will be R100 000.
   3) The joint costs allocated to products Bran and Jo will be R90 000.
   4) The joint costs allocated to products Bran and Jo will be R15 000.

Question 13:

Blue Crane Limited is currently considering a special project. The managing director has provided you with the following information relating to the two types of material required for the project:

Material	Number of units required for the contract	Number of units currently in stock	Purchase price per unit currently in stock (R)	Current purchase price per unit (R)	Current resale price (R)
A	360	480	100	108	90
B	1500	750	250	220	180

Material A is in regular use by the company. Material B is of a specialised nature and has no foreseeable use in the business.

Required:

a) What would the relevant cost for material A be in deciding on the viability of the special project?
b) Calculate the relevant cost for Material B.

Question 14:

Choose the most fitting option: A responsibility centre in which a manager is responsible for sales revenues, costs as well capital investment decisions is a(n):
1) Cost or expense centre
2) Revenue centre
3) Profit centre
4) Investment centre

Question 15:

Consider the following statements and determine which statements are **true?**
1) A regression equation identifies an estimated relationship between a dependent variable and one or more independent variables.
2) The least-squares method is a mathematical method of determining the regression line of best fit.
3) The correlation coefficient (r) represents the degree of association between two variables, such as cost and activity.
4) A cost function is normally only valid within the range of the actual observations that were used to establish the cost function equation.

Question 16:

Palm (Pty) Ltd is a supplier of woodworking tools. One of its products is a sanding machine selling at R4 900. The company sells on average approximately 20 sanding machines per week. Sales take place evenly throughout the year which consists of 50 weeks.

The company purchases the sanding machines at a cost of R3 430 each. The cost to place an order amounts to R300 and orders are executed within 5 weeks.

Safety inventory should amount to the sales requirement for 3 weeks.

Direct inventory holding costs are R35,00 per unit and insurance on the sanding machines amounts to 10% of the unit cost per year.

The supplier has offered a quantity discount of 5% per sanding machine on orders of 150 units. The company implemented the economic order quantity type to manage its inventory.

The current required after tax cost return on capital is 4% per annum.

Required:

   a) Calculate the economic order quantity (EOQ) for the sanding machines.
   b) Calculate the inventory holding costs for the EOQ.

   > Remember that safety stock should be taken into account. Refer to Drury, 8th edition page 642 (Drury 9th edition page 661) where the assumption that safety stock is *maintained* (thus average safety stock = total safety stock) is stated.

   c) Calculate the ordering cost for the EOQ.

Question 17:

Use the information of IM6.5 at the back of chapter 6 in your Drury text book (8th or 9th edition).
   a) Calculate the joint costs allocated to product Q using the net realisable sales value method.
   b) Calculate the estimated profit of product T using the net realisable sales value method.

   > Assume that 1 pound equals 1 Rand for purposes of this question. Round the proportion of net sales value (percentage) per product to the total net sales value to 1 decimal. You need to allocate the joint cost based on the proportion of net sales value (xx,x%) of the specific product.

Question 18:

You are an accounting clerk at Mahogany Limited. Mr Elder, one of the sales representatives, requested your department to estimate the expected maintenance cost of his vehicle for August 2014. He gave a summary of the average number of kilometres travelled per day for the past seven months, as well as of the average daily maintenance costs for the corresponding period.

Your departmental head, being in a hurry, supplied you with only the following information:

Period: August 2013 - February 2014

Σx	=	1 980
Σy	=	1 324
Σx^2	=	563 400
Σy^2	=	251 676
Σxy	=	376 510
r	=	0,9816

Relevant formulae:

y	=	$a + bx$
Σy	=	$na + b\Sigma x$
Σxy	=	$a\Sigma x + b\Sigma x^2$

The 'average daily kilometres travelled' for each month represents one observation. Seven months therefore means that seven observations apply.

Required:

   a) Determine the value of a, assuming that b = 0,6004.
   b) Determine the average daily maintenance cost if 250 kilometres per day are travelled.

Question 19:

Sycamore Ltd manufactures a single product in one process. The following information for July 2013 is available:

	Units	Raw material	Conversion costs
WIP – 1 July 2013 (40% completed)	20 000	72 000	33 100
Finished products transferred	71 000	?	?
Put into production	80 000	266 500	155 400
WIP – 31 July 2013 (75% completed)	16 000	?	?

Additional information:

1. Raw material is added at the beginning of the process and conversion costs are incurred evenly throughout the process.
2. Normal loss is estimated at 10% of the units that have reached the wastage point.
3. Losses occur when the process is 50% completed.
4. The FIFO method of inventory valuation is used.

Required:

Calculate the equivalent units of abnormal loss in terms of conversion costs for July 2013.
You are required to make use of the short-cut method if the requirements for its use are met.

Can you see here that we can force you to use a certain method – it is therefore important that you have to know both the long method (as taught in MAC2601) as well as the short-cut method. The most important point to remember is that the requirement to make use of the short-cut method is that **all of the units** (including opening- and closing wip) should have reached/passed the wastage point in the period under review.

Question 20:

SA Slabs Limited specialised in the manufacturing of concrete slabs which are used in the building of houses. Only one size slab was manufactured during the past financial year. The company makes use of a standard costing system and stock records are kept at standard cost.

The budgeted information for the past financial year ended 31 March 2014, at a capacity utilisation of 20 000 labour hours, was as follows:

	Production cost (per slab) R
Material- 10kg "Ready mix" concrete at R1,70 per Kg	17
Labour - 2 hours at R6 per hour	12
Variable manufacturing overheads	16
Fixed manufacturing overheads	20
	65

Overheads are allocated to production on the basis of labour hours.

The actual results for the year ended 31 March 2014 were as follows:

	Total production cost R
Material (at R1,75 per Kg)	176 400
Labour	165 000
Variable manufacturing overheads	171 600
Fixed manufacturing overheads	205 000

Additional information:

1.   10 500 slabs were actually manufactured.
2.   The change in inventory levels of materials and finished goods during the year was insignificant.
3.   Due to wild cat strikes and after negotiations with trade unions, a 25% wage increase for all the production workers came into being from 1 April 2013. The effect being that the actual wage rate for the budgeted period differed from the budgeted wage rate. The budget for the past year had already been finalised and the standard labour rate was left as initially shown in the budget.

Required:

a)   Determine the total variable production cost as budgeted for the past financial year which ended on 31 March 2014.   (3)

b)   Calculate the appropriate variances in respect of each of the following production cost elements:
     i)   Material   (6)
     ii)   Labour   (7½)
     iii) Variable manufacturing overhead   (5½)
     iv)   Fixed manufacturing overhead   (10)
                                                                                                          [32]

Question 21:

Bunting Limited has two divisions, namely Sparrow and Thrush. The performance of these divisions is currently under review.

You are provided with the following information:

	Net assets	Profit
	R	R
Sparrow	300 000	70 000
Thrush	650 000	140 000

Bunting Limited has a current cost of capital of 15%.

Required:

a)   Calculate the return on investment (ROI) and residual income (RI).   (5)
b)   State which method of performance evaluation (ROI or RI) would be more useful when comparing the performance of each divison and why.   (2)
c)   Using ROI as a basis, discuss whether the manager of the Sparrow division should invest in a proposed project offering a 22% return. Your answer should state whether he/ she is acting in the best interests of Bunting Limited.   (4)
                                                                                                          [11]

Question 22:

Kid Buzz is a family owned business specialising in the manufacture of electronic children's toys. The company currently produces a circuit board that is used in its most popular line of children's computers. Recently, they have been approached by an outside supplier offering to sell 8 000 circuit boards to Kid Buzz at a price of R19 each.

The financial manager has provided you with the following information relating to the costs of producing 8 000 circuit boards annually:

	Total for 8 000 circuit boards R	Unit cost R
Direct materials	48 000	6
Direct labour	32 000	4
Variable overhead	8 000	1
Supervisor's salary	24 000	3
Depreciation of specialised equipment	16 000	2
Allocated general overheads	40 000	5
Total cost	**168 000**	**21**

Additional information:

1. It is expected that the cost of all labour will increase by 10% in the following financial year. All other costs are expected to remain unchanged in the foreseeable future if Kid Buzz continues to manufacture the circuit boards.
2. If Kid Buzz outsources the circuit boards, the labour currently employed can be utilised in other departments.
3. Should Kid Buzz no longer produce these circuit boards, the specialised equipment which has no other use could be sold for R30 000.

Required:

Advise Kid Buzz on whether they should continue manufacturing the circuit boards (You should use the comprehensive approach and explanations for each item included in your calculations). (11)

Question 23:

Oceana Ltd produces two different products namely the Coral and Shell. Both products require processing in the machining and finishing department.

	Contribution per unit R	Machining time required per unit (minutes)	Finishing time required per unit (minutes)	Raw material (Silica) required per unit (Kg)
Coral	2	6	10	-
Shell	2,50	12	6	3 kg

Additional information:

1. The daily capacities of each department are 1 200 minutes each.
2. Silica, the raw material required in the production of Shell, is a scarce resource and is limited to 270kg per day.
3. The demand for Coral and Shell are unlimited.

Required:

By making use of linear programming techniques, specify the product mix that will maximise daily contribution. (13)

Question 24:

The following budgeted information relates to Tanugo Plc:

	Product TA	Product NU	Product GO
Sales in units	10 000	20 000	25 000
Selling price per unit	R180	R120	R100
Variable cost per unit	R90	R64	R60
Direct fixed costs	R80 000	R65 000	R50 000

Common fixed costs amount to R825 000.

Required:

a) Calculate the budgeted profit for Product GO.
b) Calculate the total budgeted profit for Tanugo Plc.

Question 25:

The following information was obtained from Dango Limited for the year ended 31 May 2014 about two of its subsidiaries:

	Dan CC R	Goli Ltd R
Net profit	500 000	1 200 000
Fixed costs	180 000	900 000

Required:

a) Calculate the operating leverage of Dan CC and Goli Ltd.
b) Which one of the following statements is correct?
   1) Dan CC is more at risk to negative market changes because it has a lower profit.
   2) Dan CC is more at risk to negative market changes because it has a lower operating leverage.
   3) Dan CC is more at risk to negative market changes because it has both a lower operating leverage and a lower profit.
   4) Goli Ltd is more at risk to negative market changes because it has a higher profit.
   5) Goli Ltd is more at risk to negative market changes because it has a higher operating leverage.

Question 26:

The raw material specification for product Toy shows that 2 units of Toy can be manufactured from the following mixture of raw materials:

Raw material	Quantity required (Kg)	Standard cost per Kg	Total material cost (R)
Rubber	1,5	5,00	7,50
Plastic	0,5	2,00	1,00
	2,0		8,50

During a particular production run, the following results were obtained:

Raw material used:
Rubber   1 800 kg
Plastic   2 200 kg

Required:

    a) Calculate the raw material mixture variance.
    b) If three thousand (3 000) units (Toys) were completed during the production run, calculate the raw material yield variance.

Question 27:

Consider the following statements:

1.   The mission of an organisation describes in very general terms the broad purpose and reason for an organisations existence.
2.   Strategic planning begins with the specification of objectives towards which future operations should be directed.
3.   Corporate objectives relate to the specific objectives of individual units within the organisation, such as a division or one company within a holding company.
4.   Unit objectives are normally set for the organisation as a whole and are then translated into corporate objectives.

Which of the above statements is **true?**

Question 28:

Which one of the following is not considered as a holding cost?

1)   Incremental material holding costs
2)   Cost of obsolescence and deterioration of inventory
3)   Opportunity cost of investment in inventories
4)   Incremental cost of placing an order

Question 29:

Falcon Limited operates three divisions from their head office in Cape Town. Organisational overheads relating to head office costs are charged to the divisions based on their turnover. One of these divisions has been making losses for the past two financial years. A decision needs to be taken on whether or not to close it down. In your decision, allocated general expenses from head office will be:

1)   Included because they represent the division's fair share of costs
2)   Included because they are incremental
3)   Ignored because they are not caused/ incurred by the division
4)   Ignored because they are fixed

Question 30:

Shearwater Limited has to decide on the optimal product mix for the next period. During this period, machine time will be limited to 1 500 hours. You have been provided with the following information:

Product	Demand (units)	Machine time per unit (minutes)	Contribution per unit (R)
Product A	1 800	30	1 500
Product B	600	45	1 200
Product C	1 275	67,5	1 912,50

Required:

If the total budgeted fixed costs for the next period amount to R1 275 000, calculate the optimal product mix for the next year.

2. SOLUTIONS TO ADDITIONAL QUESTIONS

Question 1:

a) Economic order quantity

$$= \sqrt{\frac{2 \times U \times C}{H + (P \times i)}}$$

$$= \sqrt{\frac{2 \times 8\,500 \times R175}{R25 + (R450 \times 20\%)}}$$

$$= \sqrt{\frac{R2\,975\,000}{R115}}$$

= 160,840

≈ 161

b) Reorder point = (average rate of usage x lead time) + safety stock
= (8 500/330) x 6 + 30
= 184,545
≈ 185

Question 2:

a) Learning curve = $\dfrac{\text{Cumulative average time per unit}}{\text{Previous cumulative average time per unit}} \times \dfrac{100}{1}$

= $\dfrac{(192/2)}{120}$ x $\dfrac{100}{1}$

= 80%

Please take note of the following:

If you express the "learning curve" as a decimal, it is 0,80. This refers to the learning **rate**.
If you are asked to calculate a learning curve, your answer will have to be expressed as a percentage.

b) Time required to manufacture the 12 sets of dining tables and chairs:

Average time = $120 \times 0,80^4$
= 49,152 hours

Total time = 49,152 x 16
= 786,432 hours

OR

Doubling	Total units	Average time per unit Hours	Total time Hours
	1	120,00	120,00
1	2	96,00	192,00
2	4	76,80	307,20
4	8	61,44	491,52
8	16	49,152	**786,432**

Time required to manufacture the 12 dining tables and chairs:

	Hours
Total time to manufacture 16 units	786,432
Less: Total time to manufacture the first 4 units	307,200
Total time to manufacture the next 12 units	479,232
	≈ 479

c) Direct cost of manufacturing 12 sets of dining tables and chairs:

	R
Direct labour R(15 360/307,20 X 479) **or** R50 x 479	23 950
Direct material R(23 210/4 X 12 X 110%)	76 593
Variable overheads:	
Variable to labour R(22 000 X 40% /307,2 X 479)	13 721
Variable to direct material R(22 000 X 60%/4 X 12 X 110%)	43 560
Fixed costs (Usually irrelevant in the short term)	-
Organisational fixed costs (not relevant as can be allocated elsewhere)	-
Total relevant cost	157 824
Mark-up 25% x R157 824	39 456
Quotation price	197 280

Students could possibly have interpreted the 40% and 60% as overhead rates. If you are ever uncertain in an exam, please state your assumption and carry on with the question.

Question 3:

a) Joint cost allocated to product Ebony and Fir according to the physical measure method

Product	Kg produced	Proportion to total	Joint costs allocated R	Cost per unit
Ebony	6 000	40%	21 000	R3,50
Fir	9 000	60%	31 500	R3,50
	15 000		52 00	

b) Joint cost allocated to product Ebony and product Fir according to the sales value at split-off point method.

Product	Kg produced	Sales value R	Proportion of sales value to total	Joint costs allocated R
Ebony	6 000	72 000	57,1%	29 977,50
Fir	9 000	54 000	42,9%	22 522,50
		126 000		52 500,00

Question 4:

Evaluation of statements:

Statements 1, 2 and 4 are correct.

Statement 3 – traditional costing system allocates overheads to production and service departments in the **first stage** of a two-stage process.

Question 5:

a) The abnormal loss for February.

QUANTITY STATEMENT

Physical units			Equivalent units			
Input		**Output**	**Raw materials**		**Conversion cost**	
(units)	**Details**	**(units)**	**Units**	**%**	**Units**	**%**
12 000	Opening WIP					
90 000	Put into production					
	Completed and transferred	79 200	79 200	100	79 200	100
	Normal loss ①	4 350	4 350	100	4 350	100
	Abnormal loss	3 450	3 450	100	3 450	100
	Closing WIP	15 000	15 000	100	11 250	75
102 000		102 000	102 000		98 250	

① Normal loss is calculated as 5% of the input that reaches the wastage point. As wastage occurs at the end of the process, only the closing WIP units will not reach the wastage point. Total input = 102 000 units, less 15 000 closing WIP units = 87 000 units that reach the wastage point.

Normal loss   =   5% x 87 000   =   4 350
Therefore abnormal loss   =   7 800 – 4 350 =   3 450

Abnormal wastage is 3 450 units.

b) Calculate the equivalent cost per unit in terms of material.

PRODUCTION COST STATEMENT

	Total R	Material	Conversion Cost
Opening work-in-process	19 689	16 230	3 459
Current production cost	120 786	101 745	19 041
Total	140 475	117 975	22 500
Equivalent units - per quantity statement		102 000	98 250
Equivalent cost per unit	R1,385	R1,156	R0,229

Question 6a: Refer activity 7.4 Page 121 MO 001/2015

Question 6b: Labour rate, idle time and efficiency variance

Variance analysis:

Labour rate variance = (standard wage rate per hour – actual wage rate) x actual labour hours worked
= [R12 – (R294 000 ÷ 30 000)] x 30 000 $\sqrt{}\sqrt{}$
= [R12 – R9,80] x 30 000
= R66 000 (F) ^ (2½)

Note:

Do not get confused by the "actual labour hours worked" in the labour rate variance calculation. It represents the **actual clock hours** in this instance, and **not** the actual productive hours.

Idle time variance = (actual productive hours – standard hours①) x standard work hour rate ②
= [27 600 – 27 000] x R13,333 $\sqrt{}$^
= R8 000 (F) (rounded) ^

① Standard hours = actual clock hours x (1 – allowed idle time %)
= 30 000 x 90%
= 27 000 $\sqrt{}$

② Standard clock hour rate = R12
Standard work hour rate = R12/ 90% = R13,333 (rounded) $\sqrt{}$ (4)

Alternative 1 (idle time variance):

(Actual clock hours x standard clock hour rate) – (actual work hours x standard work hour rate)
= (30 000 x R12) – (27 600 x R12/0,9)
= R360 000 – R368 000
= R8 000 (F)

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Proving that actual clock hours x standard clock hour rate = standard work hours x standard work hour rate:

Actual clock hours x standard clock hour rate
= 30 000 x R12
= R360 000

Standard work hours (allowed for actual production) x standard work hour rate
= 6 x 0,9 x 5 000 x 12/0,9
= (30 000 x 0,9) x (12/0,9)
= 27 000 x R13,333
= R359 991 (differs from R360 000 only due to rounding off the standard work hour rate)

The (30 000 x 0,9) x (12/0,9) can also be rewritten as:
= 30 000 x R12 (the x 0,9 and the /0,9 cancels out)
= R360 000

Thus: Actual clock hours x standard clock hour rate = R360 000 = standard work hours x standard work hour rate.

Note:

Remember that the "standard work/productive hours" in the idle time variance refer to the standard work/productive hours **allowed for actual production**.

Alternative 2 (idle time variance):

(Standard (allowed) idle hours – actual idle hours) x standard work hour rate
= ([5 000 x 10% x 6] – [30 000 – 27 600]) x 12/0,9
= (3 000 – 2 400) x 13,333
= 600 x 13,333
= R8 000 (F) (rounded)

Efficiency variance   = (standard quantity of labour hours for actual production – actual labour hours) x standard work hour rate
                             = [(5 000 x 6 x 0,9) – 27 600] x R13,333 $\sqrt{}\sqrt{}$
                             = R8 000 (A) (rounded)^   (2½)
                                                                                        [9]

Alternative layout of the solution (similar to MAC2601 basket method):

Actual clock hours x standard clock hour rate
= 30 000 x R12
= R360 000

Idle time variance = R7 991 (F) (differs from the R8 000 (F) only due to rounding off the standard work hour rate)

Actual work hours x standard work hour rate
= 27 600 x R13,333
= R367 991 (differs from the R368 000 only due to rounding off the standard work hour rate)

Efficiency variance = R8 000 (A)	
Actual output x standard hours x standard rate = 5 000 x (6 x 0,9) x R13,333 = R359 991 (differs from the R360 000 only due to rounding off the standard work hour rate)	

Question 7:

Divisionalisation of an organisation occurs where divisions or operations are segmented, with decision-making powers **decentralised** to the divisions. √

or

Breaking the organisation up into **separate, smaller, independently manageable (self-contained) units** (divisions).

Advantages:

- Improves the decision-making process in terms of quality. Decisions are made by people more familiar with problems (they make more informed decisions). (Drury, 2012:486; Drury, 2015:499) √
- Decisions are made quicker. (Drury, 2012:486; Drury, 2015:499) √
- Top management are freed and allowed to focus on strategic decisions. √
- Divisional managers are more motivated and achieve a higher level of self-fulfilment. (Drury, 2012:486; Drury, 2015:499) √
- Unprofitable activities will be identified quickly and will either be eliminated or turned around. √

Disadvantages:

- Duplication of activities and costs. √
- It can lead to excessive competition between divisions, which can be to the detriment of the organisation. (Drury, 2012:486; Drury, 2015:499) √
- Divisional managers could make decisions that are not congruent with overall company policy. (Drury, 2012:486; Drury, 2015:499) √
- Top management loses control to some extent. √

[10]

Question 8:

	R	Comment	
Income	1 000 000		√
Cost to date (the R750 000)	-	Irrelevant as this is a sunk cost	√
Material X	-	Purchase price of R120 000 is irrelevant as this represents a sunk cost	√
Material X	8 000	Opportunity saving if this material is used (we do not spend this)	√
Material Y (R75 000 x 1,06)	(79 500)	Replacement cost	√
Skilled labour	(320 000)	Hiring of labour on another project represents the additional cash flows of completing this project	√
Research staff	(200 000)		√
Redundancy and severance pay	-	Irrelevant as these are committed costs	√
General building expenses	-	Irrelevant as this represents an accounting allocation (common fixed costs)	√
= Relevant net income	**408 500**		

Based on the above calculations, the research project should be continued as Medix Limited will earn a relevant net income of R408 500. √ (10)

Question 9:

Calculation of contribution per unit:

	Pixie R	**Elf R**	**Queen R**	**King R**
Selling price	111	98	122	326
Less: Variable costs	(82)	(83)	(112)	(216)
Direct materials	25	35	22	25
Direct labour	40	30	75	175
Pixie: 8 x R5 √				
Elf: 6 x R5 √				
Queen:(10 + 5) x R5 √^				
King: (10 + 25) x R5 √^				
Variable overhead	17	18	15	16
= Contribution per unit	**29**√	**15**√	**10**√	**110**√

Notes:

• We can sell more units of Pixie and Elf than we can produce, as the available Type 1 hours are limited and both Pixie and Elf require Type 1 hours to be produced.
• To satisfy the demand for 1 500 units of Queen and 1 000 units of King, we will need (1 500 x 10) + (1 000 x 10) = 25 000 hours of Type 2 labour. As only 20 000 hours of Type 2 labour are available, Type 2 labour hours are also a limiting factor.
• To satisfy the demand for 1 500 units of Queen and 1 000 units of King, we will need (1 500 x 5) + (1 000 x 25) = 32 500 hours of Type 3 labour. As only 25 000 hours of Type 3 labour are available, Type 3 labour hours are also a limiting factor.
• Pixie and Elf do not require Type 2 or Type 3 hours, whilst Queen and King do not require Type 1 hours. We can therefore separate Pixie and Elf from Queen and King in our calculations.

Type 1 labour:

Only utilised by Pixie and Elf.

Contribution per hour:

	Contribution per unit R	Hours per unit	Contribution per hour R	Ranking
Pixie	29	8	R3,63 √	① ^
Elf	15	6	R2,50 √	②

Therefore, the maximum number of units of Pixie that can sell in the market should be produced. As there is an unlimited demand for Pixie, all 8 000 hours of Type 1 labour available should be used to produce Pixie. √

8 000 hours ÷ 8 hours per unit = 1 000 units
Therefore 1 000 units of Pixie must be produced and no units of Elf. √

Type 2 and 3 labour:

Type 2 labour

	Contribution per unit R	Hours per unit	Contribution per hour R	Ranking
Queen	10	10	1,00 √	②
King	110	10	11,00√	①^

Type 3 labour

	Contribution per unit R	Hours per unit	Contribution per hour R	Ranking
Queen	10	5	2,00√	②
King	110	25	4,40√	①^

King ranks first in terms of both constraints, therefore produce the maximum amount of King units that the company can sell and thereafter produce Queen.√

	Type 2 labour (hours)	Type 3 labour (hours)
Available	20 000	25 000
Less: required for King		
1 000 x 10 hours	10 000√	
1 000 x 25 hours		25 000√
Remaining for the production of Queen	**10 000**	**NIL**

Queen cannot be produced with only Type 2 labour. Therefore 1 000 units of King must be produced and no units of Queen. √   (22)

Alternative 1: Linear programming using the graphical method

Although King ranks first in terms of both the relevant limiting factors and this eliminated the need for linear programming, we can also arrive at the (same) answer using linear programming.

Let Q be the number of units of Queen and K the number of units of King.

Q and K are subject to the following constraints:
10 Q + 10 K   <=   20 000
5 Q + 25 K   <=   25 000
Q   <=   1 500
K   <=   1 000

Also, we cannot sell less than 0 units of King or Queen, therefore the following "constraints" also apply:
K >= 0
Q >= 0

(non-negativity constraints)

The individual lines that confine Q and K based on the above constraints were drawn in the graph below. If you are unsure as to how to draw the straight lines, revisit the section called "graphical method" in Chapter 25 of your text book.

We want to maximise the contribution of 10 Q + 110 K. The contribution line will be represented by a straight line with a slope of -110/10 if Q is represented on the y axis and K on the x axis.

Let's assume 1 100 units of Queen are produced and no units of King. This will render a contribution of 10 (1 100) + 110 (0) = R11 000.

If we want to earn a contribution of R11 000 producing only K and no Q, we will have to produce (and sell) 11 000 / 110 = 100 units of King.

We can therefore draw a contribution line that intersects the y axis at 1 100 and intersects the x axis at 100. Note that the graph has not been drawn exactly 100% to scale.
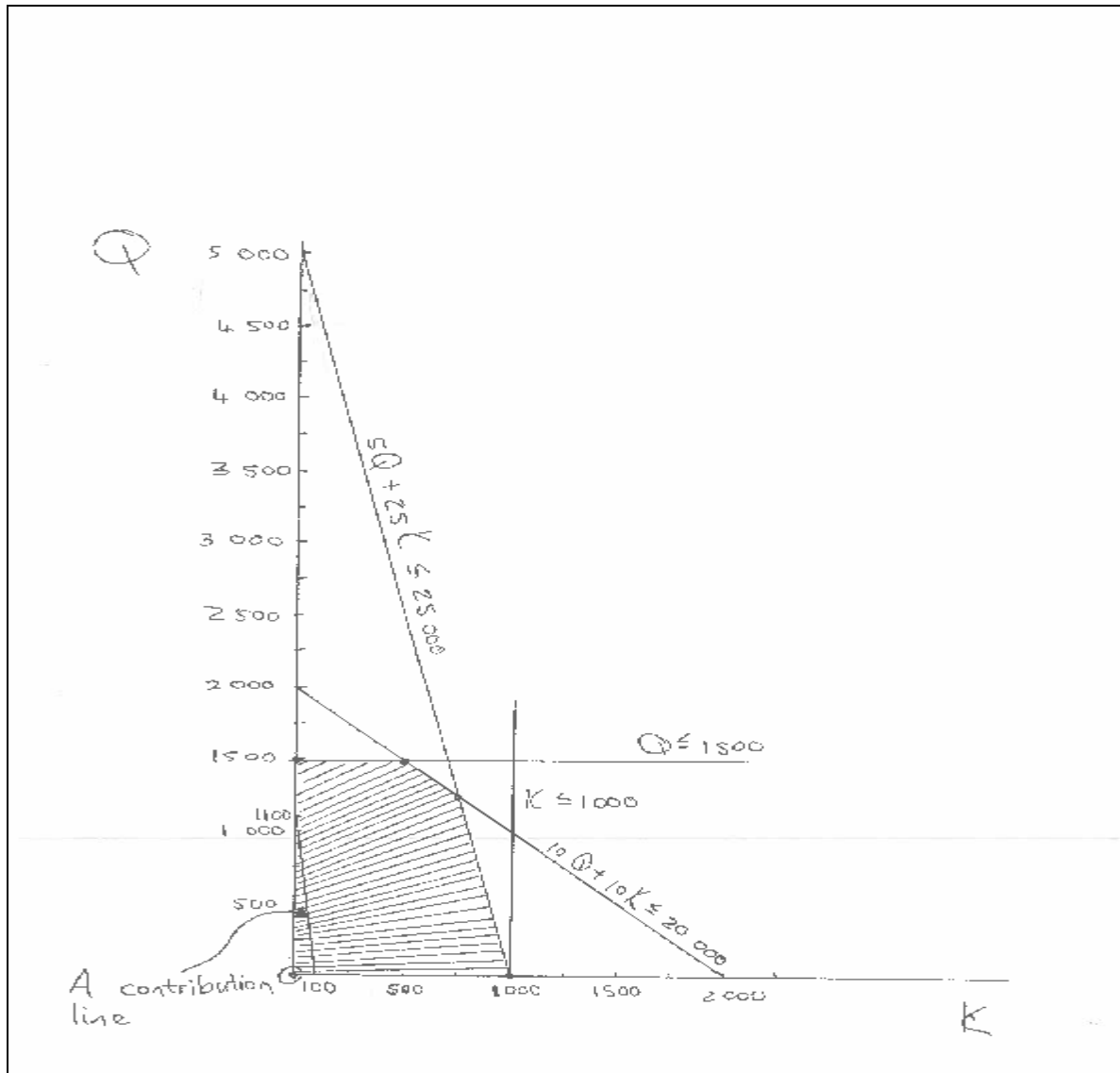
The optimal production mix of Queen and King has to be part of the shaded area. In fact, it will be at one of the corner points of the shaded area. The contribution line can be "moved" by means of holding a ruler on the line and shifting it carefully to the right (and parallel to the original line).

The corner point of the shaded area that you cross with your ruler last will render the largest contribution (maximise contribution). If you do this carefully, you will see that you will cross the corner points in the following order:
1. (0; 1500)
2. Approximately (500; 1500) if we read it off the graph.
3. The intersection of the lines that represent 10 Q + 10 K = 20 000 and 5 Q + 25 K = 25 000 (approximately (750; 1 250) if we read it off the graph).
4. (1 000; 0)

(0; 0) is another corner point of the feasible area, but contribution and profit will clearly not be maximised at this point.

Thus, we cross the point where K = 1 000 and Q = 0 last, so the contribution will be maximised at this point. We therefore have to sell 1 000 units of King and 0 units of Queen to maximise contribution and profit.

Alternative 2 (enrichment):

If you are familiar enough with linear programming, you could identify the corner points of the feasible area without drawing the graph. For this, you will have to consider where all the intersections will occur on the graph. We can then calculate the contribution at each of these points and select the point rendering the highest contribution.

This is how we reasoned in identifying the corner points (in bold are the actual corner points):

1. **As there are no minimum number of units of Queen or King that have to be sold, we can identify our first corner as (0; 0): producing no units of Queen and no units of King. This is the intersection of the two axes. At this point our contribution will also be zero.**

   Using the equation 10 Q + 10 K <= 20 000, we can calculate the two points where the straight line 10 Q + 10 K = 20 000 will intersect with the x and y axes. There is a possibility that these points can be part of our feasible area, but we will have to test them first.

2. If K = 0, Q will be 20 000 / 10 = 2 000. Therefore we have an intersection with the y axis at 2 000 units of Q. However, our demand for Q is only 1 500, so (0; 2 000) will not fall into our feasible area.

3. If Q = 0, K will be 20 000 / 10 = 2 000. Therefore we have an intersection with the x axis at 2 000 units of K. Our demand for K is only 1 000, so (2 000; 0) will also not fall into our feasible area.

   Using the equation 5 Q + 25 K <= 25 000, we can calculate the two points where the straight line 5 Q + 25 K = 25 000 will intersect with the x and y axes. There is a possibility that these points can be part of our feasible area, but we will have to test them first.

4. If K = 0, Q will be 25 000 / 5 = 5 000. Therefore we have an intersection with the y axis at 5 000 units of Q. However, our demand for Q is only 1 500, so (0; 5 000) will not fall into our feasible area.

5. **and 6. If Q = 0, K will be 25 000 / 25 = 1 000. Therefore we have an intersection with the x axis at 1 000 units of K. Our demand for K is 1 000, so (1 000; 0) will be a corner point of our feasible area. At this same corner point, the line K = 1 000 will meet the x axis.**

7. **Because the maximum number of Queen (1 500 units) is smaller than the other points where the y axis is intersect (5 000 and 2 000 – see above), (0; 1 500) will be a corner point of our feasible area.**

8. Where 5 Q + 25 K = 25 000 intersects with Q = 1 500, K will be [25 000 − 5(1 500)]/25 = 700. 10(1 500) + 10(700) = 15 000 + 7 000 = 22 000, which does not meet the criterium of 10 Q + 10 K <= 20 000 and therefore (700; 1 500) will not be a corner point of our feasible area.

9. **We can use the simultaneous equations method to determine where 5 Q + 25 K = 25 000 and 10 Q + 10 K = 20 000 will intersect. If you solve the simultaneous equations correctly, you will arrive at Q = 1 250 and K = 750. These units are within the levels of demand for Q and K (1 500 and 1 000 respectively). This point (750; 1250) will thus be a corner point of the feasible area.**

10. **Finally, where 10 Q + 10 K = 20 000 intersects with Q = 1 500, K will be [20 000 − 10(1 500)]/10 = 500. 5(1 500) + 25(500) = 7 500 + 12 500 = 20 000, which meets the criterium of 5 Q + 25 K <= 25 000 and therefore (500; 1 500) will be a corner point of our feasible area.**

Now we calculate the contribution at each of the corner points:

Corner point	Contribution
(0; 0)	10(0) + 110(0) = R0
(1 000; 0)	10(0) + 110(1 000) = R110 000
(0; 1 500)	10(1 500) + 110(0) = R15 000
(750; 1 250)	10(1 250) + 110(750) = R95 000
(500; 1 500)	10(1 500) + 110(500) = R70 000

The maximum contribution will be at (1 000; 0) and as there are no differences in fixed costs at the different points, the highest profit will also be rendered at this point. G Limited therefore has to sell 1 000 units of King and no units of Queen.

Question 10:

a) Breakeven sales (in units) = fixed costs / contribution per unit
   = R394 000 ① / R4,10 ②
   = 96 097,56...
   = 96 098 units (Round upwards as a partial unit cannot be manufactured.)

Note:
As no inventory is given in the question, the loss (R25 000) implies that the breakeven quantity has to be more than the 90 000 sales units.

①**Fixed Costs:**

Fixed manufacturing overheads	R120 000
Fixed selling expenses	R134 000
Fixed administrative expenses	R140 000
	R394 000

②Contribution per unit:

	R
Sales	900 000
Less: Variable costs	(531 000)
Direct materials	135 000
Direct labour	270 000
Variable manufacturing overheads	36 000
Variable selling expenses	90 000
Contribution	369 000

Contribution per unit = R369 000 / 90 000 units
= R4,10

Note:
- We calculate the contribution per unit as the calculation of breakeven **units** is required.
- Assume direct labour is always a variable cost for purposes of MAC3701 unless information to the contrary is given.

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b) The amount by which advertising can be increased in order to increase the sales volume from 90 000 units to 150 000 units, and to make a simultaneous profit of 5%, based on turnover.

Fixed cost after increase = contribution – profit
= 150 000 units x R4,10 – (150 000 units x R10 x 5%)
= R615 000 – R75 000
= R540 000

Note:
The contribution per unit of R4,10 remains the same if the variable cost per unit and the selling price per unit do not change when the volume (level of activity) changes.

Fixed costs before increase = R394 000 (Refer question (a))

Therefore advertising expenses need to be increased by R146 000 (R540 000 – R394 000)

Alternative:
Let the increase in advertising expenses be x

Sales – variable costs – fixed costs = net profit
(150 000 units x R10) – (150 000 units x R5,90) – (394 000 + x) = 0,05 x 150 000 x 10
1 500 000 – 885 000 – 394 000 – x = 75 000
x = 1 500 000 – 885 000 – 394 000 – 75 000
x = R146 000

Note:
Remember, there are often a few alternatives to get to an answer. Always show the formulae used and all your workings clearly (in a written question).

Question 11:

a)   The sales mix variance, for the purpose of reconciling sales, based on sales revenue.

A = Adverse
F = Favourable

Product	Actual sales quantity	Actual sales quantity in budgeted proportions	Difference	Standard selling price	Sales mix variance
SpecWise	650	1 150 ① x 700 / 1 000 ② = **805**	(155)	R1 800	R279 000 **(A)**
EyeWizz	500	1 150 ① x 300 / 1 000 ② = **345**	155	R5 250	R813 750 **(F)**
	1 150	**1 150**	**0**		**R534 750 (F)**

① 650 + 500 **= 1 150** (Total budgeted sales units)
② 700 + 300 **= 1 000** (Total actual sales units)

Alternative:

(Actual sales quantity in budgeted proportions – actual sales quantity) x standard selling price

SpecWise ((1 150 x 7/10) – 650)) x R1 800 = R279 000 **(A)**
EyeWizz   ((1 150 x 3/10) – 500)) x R5 250 = R813 750 **(F)**
                                                                    R534 750 (F)

b)   The sales price variance.

Product	Actual sales	Actual sales volume x standard selling price	Sales price variance
SpecWise	R1 131 000	650 x R1 800 = **R1 170 000**	R39 000 **(A)**
EyeWizz	R2 490 000	500 x R5 250 = **R2 625 000**	R135 000 **(A)**
			R174 000 (A)

Alternative:

(Actual selling price – standard selling price) x actual sales volume

SpecWise ((R1 131 000 / 650) – R1 800)) x 650 =   R39 000 **(A)**
EyeWizz   ((R2 490 000 / 500) – R5 250)) x 500 = R135 000 **(A)**
                                                                          R174 000 (A)

Question 12:

a)   Sales value is 500 tonnes x R50 = **R25 000**

Cash sales journal entry will be Dr Bank and Cr Inventory Li with R25 000 (Refer Drury 2012:138; Drury 2015:143)

b)   Total (adjusted) joint costs
     = Raw materials + conversion costs + (Li conversion costs – proceeds from sales of Li)
     = R45 000 + R55 000 + (R15 000 – R25 000)
     = R90 000

Question 13:

a) The relevant cost for material A in deciding on the viability of the special project:

As the company uses Material A regularly, the relevant cost must be calculated by using the current purchase price (replacement cost) per unit multiplied by the number of units for the contract. This is because the units used for the contract from current inventory will need to be replaced.

360 units x R108 = **R38 880**

b) The relevant cost for Material B:

The relevant cost for material B consists of the resale value of the units currently in inventory as this material has no foreseeable use in the company (This is an opportunity cost of not selling the 750 units currently in inventory at the current resale price of R180), plus the current purchase price of the units required for the project that are not in inventory, which will therefore have to be bought.

(750 units x R180) + (750 units x R220)
= R135 000 + R165 000
= **R300 000**

Question 14:

"**Investment centres** [own emphasis] are responsibility centres whose managers are responsible for both sales revenues and costs and, in addition, have the responsibility and authority to make capital investment decisions." (Drury 2012:402; Drury 2015:413)

Option (4) is therefore correct.

Question 15:

All these statements are correct. (Refer Drury 2012:609, 614, 617, 623 and 689; Drury 2015:629, 634, 637 and 708).

Question 16:

a) Refer to Activity 1.2 Page 13 MO 001/2015.

b) The inventory holding costs for the EOQ.

Remember that safety stock should be taken into account. Refer to Drury, 8th edition page 642 (Drury 9th edition page 661) where the assumption that safety stock is *maintained* (thus average safety stock = total safety stock) is stated.

= ((Economic order quantity / 2) + Safety inventory) x inventory holding cost per unit
= ((35 / 2) + (20 x 3)) x R515,20 (from question 1 above)
= 78 x R515,20
= R40 185,60

Note:
In terms of the EOQ, 35 units are ordered and received. By the time the next order arrives, the 35 units of inventory would have been reduced to nil. Therefore, the average inventory on hand at any time is half of the quantity ordered plus the full safety inventory required.

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c) The total ordering cost for the economic order quantity (EOQ).

= Number of orders x Variable cost of placing an order
= (Annual demand / Economic order quantity) x Variable cost of placing an order
= (1 000 / 35) x R300
= 29① x R300
= R8 700,00

Note:
Remember that it is not possible to place "half an order" – you either place an order or you don't. The ordering cost should thus be multiplied with a (full round number (integer)) number of orders.

①1 000/35 = 28,57 orders, rounded to 29 orders.

Question 17:

a) The joint costs allocated to product Q using the net realisable sales value method.

QR LIMITED

Products	Sales value R	Additional processing cost R	Net realisable value R	Proportion to total %	Joint costs allocated R	Profit R
Q	768 000	160 000	608 000	62,3	456 036	151 964
R	232 000	128 000	104 000	10,6*	77 592	26 408
S	32 000	-	32 000	3,3	24 156	7 844
T	240 000	8 000	232 000	23,8	174 216	57 784
	1 272 000	296 000	976 000	100,0	732 000	244 000

* Rounding adjusted slightly in order to get to a total of 100%.

Note:

Joint costs are all the common costs incurred up to the split-off point. These include all materials, labour and overheads incurred to yield the products at the split-off point. The joint cost in this question is thus made up as follows: Raw materials cost R268 000 + initial processing cost R464 000 = R732 000.

The method for allocating joint cost in this question has been given as the net realisable sales value (NRV at split-off) method. According to this method, the market value of the final product is taken and reduced by any costs incurred for processing of the product beyond the split-off point and by any selling and distribution costs incurred to sell the final product. These NRV values are then used to establish the ratio in which the joint costs are to be apportioned. In this way an estimated market value (net of all further costs) for the product at the split-off point is achieved. One therefore has to work back from the market value of the final product to determine an estimated market value at the split-off point (refer to study unit 19 of MAC2601 for revision purposes).

Please also note that some of the calculations above were shown for illustrative purposes and were not required in order for students to arrive at the correct answer.

b) The estimated profit of product T using the net realisable sales value method is R57 784 as per the above calculations.

Question 18:

a) The value of a, assuming that b = 0,6004.

Substitute b $=$ 0,6004 into the following equation:

Σy	=	$na + b\Sigma x$
1 324	=	7a + 1 980b
1 324	=	7a + 1 980(0,6004)
1 324	=	7a + 1 188,792
7a	=	1 324 - 1 188,792
7a	=	135,208
a	=	19,3154 (rounded)

Alternative:

Substitute b $=$ 0,6004 into the following equation:

Σxy	=	$a\Sigma x + b\Sigma x^2$
376 510	=	a(1 980) + 0,6004(563 400)
376 510	=	1 980a + 338 265,36
1 980a	=	376 510 - 338 265,36
1 980a	=	38 244,64
a	=	19,3155 (rounded)

The difference between the two alternatives is due to rounding only.

b) The average daily maintenance cost if 250 kilometres per day are travelled.

y	=	average daily maintenance cost for a given month
y	=	a + bx
y	=	19,3154 + 0,6004(250)
y	=	19,3154 + 150,1
y	=	169,42 (rounded)

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Question 19:

Quantity statement for the month ended 31 July 2013

Input		Output	Raw materials		Conversion	
(units)	**Details**	**(units)**	**Units**	**%**	**Units**	**%**
20 000	Opening work-in-process					
80 000	Put into production					
	Completed from:					
	Opening inventory	①18 000	-	0	②10 800	60
	Current production	53 000	53 000	100	53 000	100
	Completed and transferred	71 000	53 000		63 800	
	Normal loss	③10 000	-		-	
	Abnormal loss	④3 000	⑤3 000	100	⑤1 500	50
	Closing work-in-process	16 000	⑥16 000	100	⑥12 000	75
100 000		100 000	72 000		77 300	

Explanatory notes:

① Since the opening WIP passed the wastage point during the current period, only 90% of the opening WIP ended up as finished products: 20 000 x 90% = 18 000. Normal loss is 10% of the units that reach the wastage point.

② A further 60% of conversion work was done for the completion of the units of opening WIP that ended up as finished products: 18 000 x 60% = 10 800.

③ All 100 000 units that are being accounted for reached the wastage point in the current period: 100 000 x 10% = 10 000. We selected to use the short-cut method to calculate the equivalent units for this normal loss. We are allowed to make this selection, as **all** units reach the wastage point in the **current** period **and** the question did not explicitly disallow use of the short-cut method.

④ Balancing figure: 100 000 - (71 000 + 10 000 + 16 000) = 3 000.

⑤ Raw material is added at the beginning of the process and was therefore 100% wasted. Conversion takes place evenly throughout the process and conversion work is therefore lost up to the wastage point (50%). Only 50% of conversion work will therefore be lost: 3 000 x 50% = 1 500.

⑥ Closing work-in-process contains 100% raw material, but is only 75% complete in respect of conversion: 16 000 x 75% = 12 000.

Question 20:

a)   Budgeted total variable production cost

Budgeted number of slabs   = 20 000 hours ÷ 2 hours
                              = 10 000 slabs √

	R	
Material	17	^
Labour	12	^
Variable overheads	16	^
= Variable production cost per slab	45	

Total budgeted variable production costs   = 10 000 x R45 ^
                                               = R450 000   (3)

(b)   Variance analysis:

(i)   **Material**

Material price variance   = (standard price – actual price) x actual quantity purchased
                              = (R1,70 – R1,75) x (R176 400 ÷ R1,75) √√
                              = (R1,70 – R1,75) x 100 800 Kg
                              = R5 040 (A) √

Note: In MAC3701, we use the actual quantity of material *purchased* in our calculation of the material price variance. This is the recommended method as per your text book (Drury, 2012: page 434; Drury, 2015: page 445).

Material usage variance   = (standard quantity of materials for actual production – actual quantity
                                 used) x standard price
                              = [(10kg x 10 500 slabs) - 100 800kg] x R1,70 √√
                              = (105 000kg – 100 800kg) x R1,70
                              = R7 140 (F) √

Note:
As there is no stock, the standard cost of actual purchases equals the standard cost of actual input.   (6)

Note: On a thirdyear-level, you should also be able to calculate a material mix- and material yield variance. For these variances to exist, two different types of material are needed in the production of a product.

Work through Activity 7.4 on page 121 of your study guide (MO 001/2015).

(ii)   **Labour**

Labour rate variance   = (standard wage rate per hour – actual wage rate) x actual labour hours
                               worked
                            = (R6 – R7,50①) x 22 000 hours② √√
                            = R33 000 (A) √

① Actual wage rate after 25% increase   = R6 x 1,25 ^
                                            = R7,50

② Actual hours   = R165 000 ÷ R7,50 √
                      = 22 000 hours

Labour efficiency variance = (standard quantity of labour hours for actual production – actual labour hours) x standard wage rate

= [(10 500 x 2 hours) – 22 000 hours] x R6 √√

= (21 000 hours – 22 000 hours) x R6

= R6 000 Adverse √ (7½)

> Note:
> On a thirdyear-level, you should also be able to split the efficiency variance into an idle time variance and an efficiency variance. In order to calculate idle time variance, information should be supplied about the clock- and work-/operating-/production hours.

(iii) Variable manufacturing overhead

Variable overhead expenditure variance = (Budgeted variable overheads for actual input volume – actual variable overhead cost)

= (22 000 hours x R8) – R171 600 √√

= R176 000 – R171 600

= R4 400 (F) ^

Variable overhead efficiency variance = (standard quantity of input hours for actual production – actual input hours) x variable overhead rate

= [(10 500 x 2) – 22 000] x R8 √√

= (21 000 – 22 000) x R8

= R8 000 (A) √ (5½)

(iv) Fixed manufacturing overhead

Fixed overhead expenditure variance = Budgeted fixed overheads – actual fixed overheads

= (R20 x 10 000 slabs) – R205 000 √√

= R200 000 – R205 000

= R5 000 (A) ^

Volume capacity variance = (actual hours of input – budgeted hours of input) x standard fixed overhead rate

= (22 000 hours - 20 000 hours) x R10 √√

= R20 000 (F) ^

Volume efficiency variance = (standard quantity of input hours for actual production – actual input hours) x standard fixed overhead rate

= [(10 500 slabs x 2 hours) – 22 000 hours] x R10 √√

= (21 000 – 22 000) x R10

= R10 000 (A) ^

Fixed overhead volume variance = (actual production **units** – budgeted production **units**) x standard fixed overhead rate

= (10 500 – 10 000) x R20 √√

= R10 000 (F) ^

Alternative:
Fixed overhead volume variance = volume capacity variance + volume efficiency variance

= R20 000 (F) + R10 000 (A) √√

= R10 000 (F) ^

(10)

[32]

When a company makes use of an absorption costing system, additional variances occur. A fixed overhead expenditure and volume variance can be calculated. The expenditure variance is the same as that calculated for the variable costing system.

The volume variance arises due to the fact that fixed overheads are allocated to products based on predetermined fixed overhead recovery rates. The volume variance can also be made up of the volume capacity variance and the volume efficiency variance.

Exhibit 17.5 in your Drury textbook illustrates the fixed overhead variances and sub-variances that you can calculate for an absorption costing system.

When we calculate the fixed overhead volume variance, we work with budgeted and actual **output** units and cost per unit. When we calculate the **volume capacity** and the **volume** efficiency variances, we work with **direct labour hours (or another allocation base)** and the cost per labour hour.

VERY IMPORTANT: The fixed overhead volume variance is **part of the sales margin volume variance**, as discussed in section 3.4 of your study guide. Remember that the sales **margin** volume variances are expressed in standard unit **contribution** margins for a **variable** costing system and standard unit **profit** margins for an **absorption** costing system. This is multiplied in both cases by the difference between the actual units sold and the budgeted units to be sold.

It is important that you understand the difference between variances in an absorption costing system and variances in a variable/direct costing system.

Question 21:

a) **Return on investment (ROI)** = controllable 'operating' profit / controllable investment

Sparrow = R70 000/ R300 000 = 23,33% √
Thrush = R140 000/ R650 000 = 21,54% √

Return on investment: Only operating controllable profit and operating controllable assets/liabilities should be taken into account in the calculation of ROI. Net operating profit is profit before interest and taxes and is sometimes referred to as EBIT (earnings before interest and taxes).

Residual income = Controllable profit less cost of capital of controllable investment

Sparrow = R70 000 – (R300 000 x 15%) = R25 000 √^
Thrush = R140 000 – (R650 000 x 15%) = R42 500 √^ (5)

b)   -ROI would be a better measure when comparing the performance of these 2 divisions as it is a
         relative measure (based on a percentage returns). √
         -ROI is particularly useful when **comparing** the performance of divisions of different sizes.√   (2)

c) -The proposed project offers a 22% return which is less than the current ROI of 23,33%. √
-The manager of the Sparrow division would therefore be reluctant to invest in this project. √
-This decision (of the divisional manager not to invest) would not be in the best interests of the company as a whole. √
-The proposed project should be invested in as the return of 22% that it is offering is in excess of the current cost of capital of 15%. √ (4)

[11]

Question 22:

	Total cost of continuing to make 8 000 circuit boards R	Total cost of purchasing 8 000 circuit boards R	
Direct materials	48 000		√
Direct labour (R32 000 x 1,10)	35 200		√
Variable overhead	8 000		√
Supervisors salary (R24 000 x 1,10)	26 400		√
Depreciation of specialised equipment ①	-		
Salvage value of specialised equipment ②	30 000		√
Allocated general overheads ③	-		
Outside purchase price (R19 x 8 000)		152 000	√
Total cost	**147 600**	**152 000**	
Difference in favour of continuing to manufacture the circuit boards	4 400		

① Depreciation of specialised equipment

Because the equipment has already been purchased, this depreciation is a sunk cost and is therefore irrelevant. √

② Salvage value of specialised equipment

This is an opportunity cost as the proceeds of selling this equipment is foregone in order to continue manufacturing these circuit boards. √

③ Allocated general overheads

It is likely that general overhead costs will remain unchanged if circuit boards are purchased from an outside supplier. They are therefore irrelevant as they are based on an accounting allocation (common fixed costs). √

Kid Buzz should therefore continue to manufacture the circuit boards. √ This would be R4 400 cheaper than purchasing them from an outside supplier. √ (11)

Question 23:

Linear programming model

Maximise C = 2C + 2,50S √

Subject to:
6C + 12S ≤ 1 200 (Machining department) √
10C + 6S ≤ 1 200 (Finishing department) √
3S ≤ 270 √
C ≥ 0; S ≥ 0   Non-negativity constraints

	Y-axis (Coral) (substitute S=0)	X- axis (Shell) (substitute C=0)
Machining department	200 ^	100 ^
Finishing department	120 ^	200 ^
Raw material (silica)		90 ^
Contribution line (random contribution = R200)	100 √	80 √

By making use of the contribution line, we can conclude that this is the optimal point √
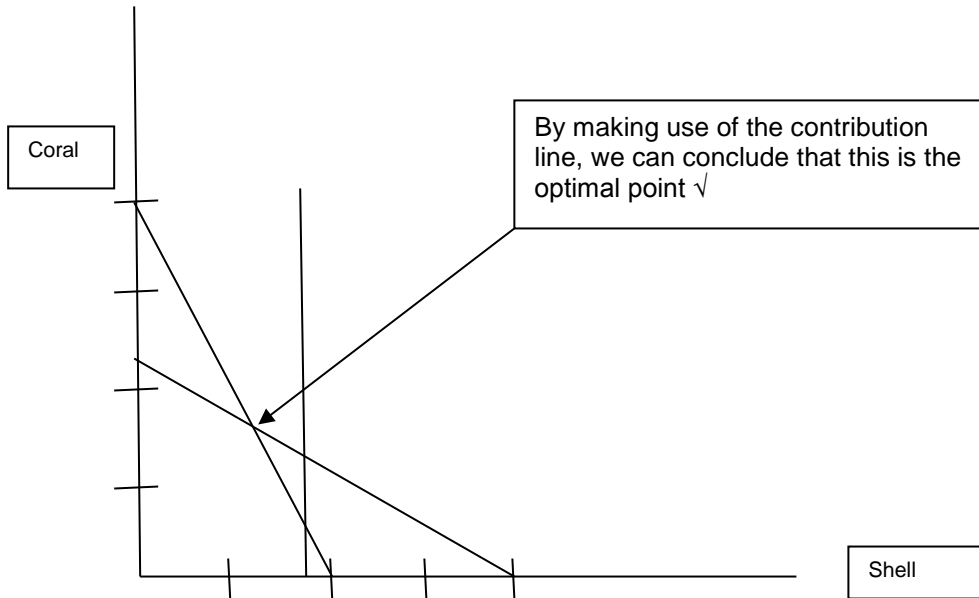
Optimal point:

6C + 12S = 1 200 ① ^
10C + 6S = 1 200 ② ^

The aim of using the simultaneous equation method, is to solve one variable, either C or S.

In order to do this, we want to add two equations together or subtract two equations from each other and cancel out one variable all together.

We have therefore decided to multiply equation ② with 2, in order to get another "12S". If we then subtract the two equations from each other, it will result in being left with only one variable (C) to solve in a new equation (equation ④).

Multiply equation ② with 2:   20C + 12S = 2 400   ③

Now, subtract equation ① from equation ③:
③ - ①: 20C + 12S   = 2 400 ③
                6 C + 12S   = 1 200 ①
                14C   = 1 200 ④

Solve: 14C   = 1 200 ④
                 C   = 85,71
                             ≈ 86 units √

Substitute C = 86 into ①
6(86) + 12S   = 1 200
        S   =   57 √

Therefore 86 units of Coral must be produced and 57 units of Shell. ^   (13)

36

Question 24:

	Product TA	Product NU	Product Go	Total
Sales	1 800 000	2 400 000	2 500 000	6 700 000
Less: Variable costs	900 000	1 280 000	1 500 000	3 680 000
Contribution	**900 000**	**1 120 000**	**1 000 000**	**3 020 000**
Less: Direct fixed costs	80 000	65 000	50 000	195 000
Product profit	**820 000**	**1 055 000**	**950 000**	**2 825 000**
Less: Common fixed costs				825 000
Total profit				**2 000 000**

a) The budgeted profit for product GO is R950 000

> **Note:**
> Common fixed costs of R825 000 were ignored in the calculation of individual products' profit as no basis of allocation to products was given in the scenario.

b) The total budgeted profit for Tanugo Plc is R2 000 000.

Question 25:

a) The operating leverage of Dan CC and Goli Ltd.

	Dan CC	Goli Ltd
Net profit	R500 000	R1 200 000
Add: Fixed costs	R180 000	R900 000
Contribution	**R680 000**	**R2 100 000**

	Dan CC	Goli Ltd
Operating leverage	R680 000/R500 000	R2 100 000/R1 200 000
	= 1,36	= 1,75

> **Note:**
> Contribution margin or "Contribution" = Sales – Variable cost (Drury 2012:172; Drury 2015:176)
> Contribution margin ratio = Contribution/Sales (Drury 2012:173; Drury 2015:177)
> The term operating leverage is used as a measure of the sensitivity of profits to changes in sales. It is measured by dividing total contribution by total profit (Drury 2012:185; Drury 2015:190)

b) Goli Ltd has a higher operating leverage due to its high fixed costs (R900 000). They would need to sell much more units in order to break even and therefore are also more vulnerable to changes in their sales volumes.
(Thus option (5) is correct)

> **Note:**
> High levels of operating leverage lead to higher risk arising from highly volatile profits but the increase in risk also provides the potential for higher profit levels when sales are expanding (Drury 2012:185; Drury 2015:190)

Question 26:

a) Calculation of raw material mixture variance:

Formula	**=**	**Actual quantity in standard mix proportions X standard price:**		
Rubber:		4 000 X 1,5/2 X R5	=	R15 000
Plastic:		4 000 X 0,5/2 X R2	=	R2 000
Total :			**=**	**R17 000**

Formula	**=**	**Actual quantity used X standard price:**		
Rubber:		1 800 X R5	=	R9 000
Plastic:		2 200 X R2	=	R4 400
Total :			**=**	**R13 400**

Material mix variance = R17 000 – R13 400 = **R3 600 Favourable**

Or alternatively:

Material mix variance = (actual quantity used in standard mix proportions – actual quantity used) x standard price

	Actual usage in standard mix proportions	Actual usage in actual proportions	Standard price	Mix variance R
Rubber	4 000 ① x 1,5/2 ② = 3 000	1 800	R5	6 000 (F)
Plastic	4 000 ① x 0,5/2 ② = 1 000	2 200	R2	2 400 (A)
				3 600 (F)

① Total number of kilogram issued to production = 1 800 kg + 2 200 kg
= 4 000 kg

② Total kg required for 2 units = 1,5 kg + 0,5 kg and ratios 1,5/2 or 0,5/2
The above layout is preferable when causes of variances have to be dealt with.

b) Calculation of raw material yield variance:

Formula	**=**	**Actual output X standard cost per unit of output**		
	=	3 000/2 X R8,50	=	R12 750

Formula	**=**	**Standard output from actual input of material X standard cost**		
Rubber:		4 000 X 1,5/2 X R5	=	R15 000
Plastic:		4 000 X 0,5/2 X R2	=	R2 000
Total:			**=**	**R17 000**

Raw material yield variance = R12 750 – R17 000 = **R4 250 Unfavourable**

Or alternatively:

Material yield variance = (actual yield – standard yield from actual input of material) x standard cost per unit of output

	Input allowed for *actual output* (Input allowed for actual yield)	Actual usage in standard mix proportions	Difference at standard price	Yield variance R
Rubber	1 500③ x 1,5kg = 2 250kg	3 000kg ④	(750) x R5	3 750 (A)
Plastic	1 500③ x 0,5kg = 750kg	1 000kg ④	(250) x R2	500 (A)
				4 250 (A)

③: 3 000 units was completed during production run. Material specifications are given for the production of 2 units of Toy. Therefore 3 000/2 = 1 500.
(Alternatively, you could have said 3 000 x 0,75kg (for 1 unit) = 2 250kg
and 3 000 x 0,25kg (for 1 unit) = 750kg)

④ We have already arrived at these numbers in our material mix variance calculations.

Note:
It is very important that you use the input **allowed for actual output** in your calculation above. The output is also called the "yield".

Question 27:

Evaluation of statements:

Statement 1 is true
Statement 2 is true

Statements 3 and 4 are false and should have read as follows to be true:

3. **Unit objectives** relate to the specific objectives of individual units within the organisation, such as a division or one company within a holding company.
4. **Corporate objectives** are normally set for the organisation as a whole and are then translated into **unit objectives**.

Question 28:

The incremental cost of placing an order is not a holding cost.

Option (4) is therefore correct.

Note: For a detailed explanation on what holding cost is made up of, refer to Drury 8th Edition page 634; 9th Edition page 654.

Question 29:

Head office costs will not be affected by the decision to close or not. These costs are therefore irrelevant and should be ignored.

Option (3) is therefore correct.

Note:
Allocated common fixed costs are irrelevant for decision-making.
Facility sustaining cost, such as general administrative cost and property sustaining costs are examples of common fixed costs. They are incurred to support the organisation as a whole and generally will not change whichever alternative is chosen (Drury 2012:195; Drury 2015:199)

Question 30:

Product	Contribution per limiting factor		Ranking
Product A	R1 500 ÷ 0,5 =	R3 000	①
Product B	R1 200 ÷ 0,75 =	R1 600	③
Product C	R1 912,50 ÷ 1,125 =	R1 700	②

	Hours
Available machine hours	1500
Less: utilised for 1 800 units of Product A (1 800 x 0,5)	(900)
= Available for the production of product C	600
600 ÷ 1,125 = 533,33 ≈ 533 units Product C	(600)
=	NIL

Therefore 1 800 units of Product A and 533 units of Product C must be produced.

Note:
When limiting factors apply, profit is maximised when the greatest possible contribution to profit is obtained each time the scarce or limiting factor is used (Drury 2012:201; Drury 2015: 205)

If 534 units of Product C get manufactured, it would use 534 units x 1,125 hours = 600.75 hours, while only 600 hours are available for the production of product C.

ANNEXURE A:

MAC3701 MAY/JUNE 2014 EXAMINATION:

Please note that lecturers are by no means required to supply students with suggested solutions to past examination papers. The May/June 2014 MAC3701 examination question paper has been put on myUnisa (available in both English and Afrikaans) as a courtesy for students to get an idea on how syllabus may be examined.

This is the suggested solution to the May/June 2014 MAC3701 examination which is available on MyUnisa.

Please note that this suggested solution does not necessarily contain all the possible alternative approaches to these questions. Please also note that this paper should not be seen as an indication of the topics that will be asked in the next examination.

It is in your own interest to attempt the questions as if in an exam setting and thereafter to work through the suggested solution in conjunction with the questions and your own answer.

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QUESTION 1

Atlantic (Pty) Ltd

Calculations:

①   Number of orders   =   Total demand/EOQ
                                         =   38 000/ 855
                                         =   44,44
                                         =   45 orders

②   Holding cost per unit   =   (R50 x 14%) + R3 + (R50 x 5%)
                                         =   R12,50

__Note:__

In order to calculate the ordering cost for the two options, the number of orders should be multiplied by the ordering cost per order that was given in the question. In order to calculate the number of orders for the EOQ model, the total demand should be divided by the economic order quantity (see calculation ① above).

Remember that it is not possible to place **"half an order"** – you either place an order or you don't. The ordering cost should thus be multiplied with a (full round number (integer)) number of orders and therefore the 44,44 orders was rounded up to 45 orders.

Holding cost per unit → make sure you know what elements are included in holding cost. Students often did not take into account the insurance cost. For a detailed explanation on what holding cost is made up of, refer to Drury 8th Edition page 634; 9th Edition page 654.

Determine whether Atlantic (Pty) Ltd should accept the special offer.

	EOQ R	Special offer R
Unit cost: 38 000 x R50 38 000 x R49	1 900 000	1 862 000
Ordering cost: R120 x 45 ① R120 x 38	5 400	4 560
Holding cost: (855/2* + 150) x R12,50 ② [(38 000/38)/2* + 150] x R12,50 *holding cost is based on average inventory	7 218,75	8 125,00
Additional storage R600 x 12	-	7 200
	1 912 618,75	**1 881 885,00**

Note: Same marks are to be awarded if students leave the 150 out of both calculations.

The special offer should therefore be accepted as (R1 912 618,75 – R1 881 885) R30 733,75 will be saved. (10)

Note:
Students often recalculated the given EOQ. This wasted unnecessary time as this figure was given in the question.

Please take note that holding cost is calculated on average inventory (assuming that holding costs are constant per unit). Refer to page 636 Drury 8th Edition; page 656 Drury 9th Edition for a further explanation on the formula method.

Also remember to multiply the monthly additional storage cost with 12 to get an annual figure.

PART B

Learning Curve = $\dfrac{\text{Cumulative average time per unit}}{\text{Previous cumulative average time per unit}}$

$= \dfrac{(50\,000+46\,000)/2}{50\,000}$

= 96%

Units	Total time (hours)	Cumulative average time per unit (hours)
1	50 000	50 000
2	96 000	48 000
4		46 080
8		44 236,80
16	679 477,25	42 467,33
32	1 304 596,32	40 768,63

Or:

Cumulative average time per unit to manufacture 16 units	$50\,000 \times 0{,}96^4 =$ **42 467,33 hours**
Cumulative average time per unit to manufacture 32 units	$50\,000 \times 0{,}96^5 =$ **40 768,63 hours**

or

$Y = ax^b$

$= 50\,000(16)^{(\log 0{,}96/\log 2)}$

$= 50\,000(16)^{(-0{,}040822/0{,}693147)}$

$=$ **42 467,33 hours**

$Y = ax^b$

$= 50\,000(32)^{(\log 0{,}96/\log 2)}$

$= 50\,000(32)^{(-0{,}040822/0{,}693147)}$

$=$ **40 768,63 hours**

Note:
The logarithm function is indicated by (LN) on your calculator. The index of learning (b) is calculated as a logarithm of the learning curve divided by a logarithm of 2.

Total time required to manufacture 32 units	1 304 596,32	
Less: Time required for units 1-16	679 477,25	
= Time required to manufacture helicopters 17 – 32	**625 119,07**	(6)
		[16]

Note:
Many students obtained full marks for this question. Take note that there is quite a few alternative ways of getting to the correct solution. Find and practise the method that works best for you.

It is important that students know how to apply a learning curve to a given set of information and not only how to calculate it.

On a third-year level, students have to know their formulae – <u>no</u> "formula sheet" will be provided. It is important that you <u>know how to apply</u> the formulae and how to <u>interpret the answers</u> to questions wherein formulae were used.

QUESTION 2

Cleo Ltd

Activities	Overhead cost R	Cost driver volumes	Activity rates
Material handling	150 000	150 movements	R1 000 per material movement
Material procurement	50 750	350 orders	R145 per order
Set-ups	150 000	100 set-ups	R1 500 per set-up
Quality control	250 700	230 inspections	R1 090 per inspection
Production	600 000	50 000 hours	R12 per direct labour hour

Marks were fully awarded if a student did not show these workings but got the calculations that now follows correct.

Calculation of activities rates:

	Duff		Buff
Material handling (100 x R1 000)	100 000	(50 x R1 000)	50 000
Material procurement (250 x R145)	36 250	(100 x R145)	14 500
Set-ups (60 x R1 500)	90 000	(40 x R1 500)	60 000
Quality control (130 x R1 090)	141 700	(100 x R1 090)	109 000
Production (40 000 x R12)	480 000	(10 000 x R12)	120 000
Total	**847 950**		**353 500**

Number of products   80 000   20 000
Overhead cost per unit   **R10,60**   **R17,68**

or

Calculation of activities rates:

	Duff		Buff
Material handling (R100 000/ 80 000)	1,25	(R50 000/ 20 000)	2,50
Material procurement (R36 250/ 80 000)	0,45	(R14 500/ 20 000)	0,73
Set-ups (R90 000/ 80 000)	1,13	(R60 000/ 20 000)	3,00
Quality control (R141 700/ 80 000)	1,77	(R109 000/ 20 000)	5,45
Production (R480 000/ 80 000)	6,00	(R120 000/ 20 000)	6,00
Overhead cost per unit	**10,60**		**17,68**

[9]

Note:
This question was straight-forward and very basic. Students may have used different formulae to get to the cost per unit. Rounding differences could also have occurred. Many students obtained full marks for this question.

QUESTION 3

Daisy CC

(a)   Calculation of actual breakeven sales units for April 2014

Breakeven sales   =   Fixed costs
                                      Contribution per unit

                          =   R45 250
                                  R20,78 ①

                          =   2 177,57

                          ≈   2 178 units

①   Calculation of contribution per unit

	R
Selling price (R410 000 ÷ 10 000 units)	41
Less: Variable costs	
Material R78 750 ÷ 2 500kg = R31,50 per kg R31,50 x 2 050kg = R64 575 ÷ 10 000 units = R6,46	6,46
Labour R94 575 ÷ 10 000 units = R9,46	9,46
Variable overheads	4,30
= Contribution per unit	**20,78**

Note:
Please take note that this question required you to calculate the actual breakeven sales volume. You should thus have used actual and not standard information.

In the calculation of the contribution per unit, you could have calculated the total contribution first and then divided it by 10 000 necklaces to get to a "per unit" contribution-figure.

(5)

(b) Calculation of budgeted profit

	R
Sales	40
Less costs:	25
Material	6
Labour	10
Variable overheads	4
Fixed overheads 0,5 hours x R10	5
Profit per unit	**15**

Total budgeted profit   = 10 000 units x R15 = R150 000

Calculation of <mark>actual profit</mark>

	R
Sales	410 000
Less costs:	247 400
Material (R78 750 ÷ 2 500) x 2 050	64 575
Labour	94 575
Variable overheads	43 000
Fixed overheads 0,5 hours x R10	45 250
Profit per unit	**162 600**

> Note:
>
> If a standard costing question requires you to reconcile <mark>budgeted profit with actual profit,</mark> always remember to show calculations for budgeted profit and actual profit separately as these are easy marks that you do not want to miss. You could also have shown these calculations in brackets next to the headings "budgeted profit" and "actual profit" in your reconciling statement.

	R
Budgeted profit	150 000
Add/Less: Sales margin volume variance	-
Standard profit	150 000
Sales margin price variance =(actual selling price – budgeted selling price) x actual sales volume = [(R410 000 ÷ 10 000) - R40) x 10 000 = R10 000 (F)	10 000
MATERIAL	
Issuing price variance = (standard price – actual price) x quantity of material issued to production = [(R6 x 5) – (R78 750 ÷ 2 500)] x 2 050 = (R30 – R31,50) x 2 050 = R3 075 (A)	(3 075)
Material usage variance = (standard quantity of materials for actual production – actual quantity used) x standard price per unit = [(0,2 kg x 10 000) – 2 050 kg] x R30 = (2 000 kg – 2 050kg) x R30 = R1 500 (A)	(1 500)
LABOUR	
Wage rate variance = (standard wage rate per hour – actual wage rate) x actual labour hours worked = [(R10 x 2) – (R94 575 ÷ 4 850)] x 4 850 = (R20 – R19,50) x 4 850 = R2 426 (F)	2 425

Labour efficiency variance = (standard quantity of labour hours for actual production – actual labour hours) x standard wage rate = [(0,5 hours x 10 000) – 4 850 hours] x R20 per hour = (5 000 – 4 850) x R20 = R3 000 (F)	3 000
VARIABLE OVERHEADS	
Variable overhead expenditure variance = (budgeted variable overheads for actual input volume – actual variable overhead cost) = (R4 x 10 000) – R43 000 = R40 000 – R43 000 = R3 000 (A)	(3 000)

Note: **Variable costing system:** The total sales margin variance gets split into a sales margin price variance and a sales margin volume variance. The sales margin price variance is the difference between the actual selling price and the standard selling price multiplied by the actual sales volume. The sales margin volume variance is the difference between the actual sales volume and the budgeted sales volume multiplied by the standard contribution margin. In this exam question, the actual units sold were equal to the budgeted units and therefore the sales margin volume variance would be equal to zero.

Also take note that where more than one type of product is manufactured and sold, the sales volume variance is subdivided further into a mix and quantity variance. In this exam question, only one type of product was sold, therefore no sales mix and sales quantity variance should have been calculated.

Refer to your study guide to see how sales variances get treated in an absorption costing system.

In any manufacturing process where more than one type of raw material is used, one of the basic requirements is that these raw materials must be combined in a specific proportion. The mix and yield variances therefore only arise when more than one type of material is used to manufacture a product and the combination results in different final output quantities. In certain circumstances, the mix and yield variances are therefore a further analysis of the usage variance.

In this exam question, only one type of raw material was used, therefore no material mix and material yield variances should have been calculated.

It is always important to read the scenario very carefully to identify which variances are applicable.

FIXED OVERHEADS	
Fixed overhead expenditure variance = (Actual fixed overhead costs – budgeted fixed overhead costs) = (45 250 – 50 000) = R4 750 (F)	4 750
Volume capacity variance = (actual hours of input – budgeted hours of input) x standard fixed overhead rate = (4 850 - 5 000) x (R50 000 ÷ 5 000) = R1 500 (A)	(1 500)
Volume efficiency variance = (standard quantity of input hours for actual production – actual input hours) x standard fixed overhead rate = [(0,5 x 10 000) – 4 850] x R10 = R1 500 (F)	1 500
Actual profit	**162 600**

[30]

Note:
The self-assessment assignment also had a question where budgeted and actual profit should be reconciled. It would be good practise to work through the self-assessment assignment again.

General comment about formulae: You have to know your formulae – no formula sheet will be provided. It is however not sufficient to simply know the formulae – you have to know how to apply the formulae and how to interpret the answers to questions wherein formulae were used. Simply writing down the formulae without any calculations will not necessarily earn you any marks.

QUESTION 4

a) Contract price using Mr Zenzele's normal pricing method:

Materials:		**R**	
A – In inventory	400 units x R6	2 400	
A – To purchase (2 200 – 400)	1 800 units x R10	18 000	
B – In inventory	300 units x R30	9 000	
C – In inventory	600 units x R48	28 800	
C – To purchase (900 – 600)	300 units x R35	10 500	
D – In inventory	400 units x R15	6 000	
Labour:			
Builders – Normal wage	2 builders x 6/12 x R60 000	60 000	
Builders – Once off bonus	2 builders x R1 000	2 000	
Casual labourers	4 casual labourers x R5 000	20 000	
Total variable costs		**156 700**	
100% mark-up		156 700	
Contract price		**313 400**	**(6)**

b) Contract price using relevant costing:

Materials:		Comment	R
A	2 200 units x R10	In regular use, should be replaced	22 000
B	300 units x R34	In regular use, should be replaced	10 200
C	600 units x R27	These can be sold at the resale price	16 200
C	300 units x R35	Additional units to be purchased	10 500
D	400 units x R16	Not in regular use and can replace other material in other jobs	6 400
Labour:			
Temporary workers		To be employed only if contract taken	49 000
Builders – Once off bonus	2 builders x R1 000	To be incurred only if contract is taken	2 000
Casual labourers	4 labourers x R5 000	To be incurred only if contract is taken	20 000
Equipment:			
General purpose	6 x R5 000	Opportunity cost of not renting it out	30 000
Specialised	R25 000 – R18 000	Original cost less resale value	7 000
Premises		Contract of lease already in place	0
Administrative expenses		To be incurred only if contract is taken	7 000
Contract price			**180 300**

(10)

Note:
Comments were for clarity purposes only – it was not part of the required for the question.

c) Factors to take into consideration:
- What are the expected weather conditions during the construction period?
- Are there contractual penalties for not completing the classrooms on time?
- Will the paying of bonuses set a precedent and its potential impact on staff morale?
- What are the labour law implications of letting the temporary workers go after six months?
- What are the long term benefits on the company's business? Will this contract lead to business being lost or perhaps to repeat business?
- What are the possibilities of renting out / leasing the premises?
- What marketing advantages are there to this project? It may be socially commendable and responsible to build classrooms extension and this could be used improve Mr Zenzele's public image?
- Are temporary workers available and do they require any training?
- Will the required materials be available and what is the lead time on these materials? (3)

[19]

Note:
Any 1 other valid point were also accepted.

QUESTION 5

Part A

(a)

ROI = Divisional profit/ Total divisional assets

Division 1 = R105 000/ R450 000 = 23,33%

Division 2 = R210 000/ R975 000 = 21,54%

RI = Divisional profit – (net assets x minimum required rate of return)

Division 1 = R105 000 – (R450 000 x 15%) = R37 500

Division 2 = R210 000 – (R975 000 x 15%) = R63 750

Division 1 performed better than Division 2 ito ROI.
(or any other valid comment)   (5)

(b)   ROI would be a better measure when comparing the performance of these 2 divisions as it is a
        relative measure (based on a percentage return).
         It is particularly useful when comparing the performance of divisions of different sizes.   (2)

 Note:
A similar question was asked in the self-assessment assignment. Also refer to activity 9.9

(c)   - The proposed project offers a 22% return which is less than the current ROI of Division 1 of
          23,33%.
        - The manager of Division 1 would therefore be reluctant to invest in this project.
        - This decision (not to invest) would not be in the best interests of the company as a whole.
        - The proposed project should be invested in as the return of 22% that it is offering is in excess of
          the current cost of capital for the company of 15%.
        - Or: It is in the best interest of the company as a whole to invest in the project.   (4)

 Note:
Read the question carefully – many students did not state whether the manager is acting in the best
interest of the company as a whole.

Part B

   a) Coefficient of variation = Standard deviation / expected value

	Television	**Radio**
Coefficient of variation	R55 446 / R810 432	R231 737 / R960 305
	= 6,84%	= 24,13%

                                                                                                                  (2)

50

b)

- On the surface, it seems as if the radio campaign is the most profitable.
- However, the uncertainty is higher, as evidenced by the higher standard deviation (higher risk).
- We should therefore calculate the coefficient of variation for each:
- The range of outcomes for the television campaign is grouped more closely together (smaller standard deviation).
- The coefficient of variation is also smaller for the television campaign.
- Because the outcome of the television campaign is more certain (less risky), you should recommend it.
- However, the risk appetite of management should also be taken into account.
- If managers are risk adverse, take on Television marketing plan.
- If management has a high appetite for risk, take on Radio marketing plan.
- A risk-seeking management team might be prepared to take a chance on a campaign with a 24% coefficient of variation.   Any 5 marks   (5)

> Note:
> See activity 14.10. The same principle was tested in this question.

PART C

Hoan Limited

(a) Sales budget for quarter ended 30 September 2014

	Volume (units)	Selling price R	Revenue R
July	①5 000	③150	750 000
August	5 000	150	750 000
September	②5 250	④165	866 250
Total	**15 250**		**2 366 250**

①15 000/3
②5 000 x 1.05
③R2 250 000/15 000
④R150 x 1.10   (4)

(b) Production budget (units) for quarter ended 30 September 2014

	July	August	September	Total
Sales	5 000	5 000	5 250	15 250
Plus: closing inventory	①500	500	②525	1 525
Units required	5 500	5 500	5 775	16 775
Less: opening inventory	500	500	500	1 500
Units to be produced	5 000	5 000	5 275	15 275

① 5 000 x 10%   =   500
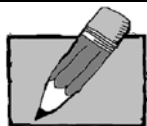②5 250 x 10%   =   525   (4)

Alternative, if student only showed a total column for the quarter and took the opening and closing inventory for only one month into consideration:

	Total
Sales	15 250
Plus: closing inventory	525
Units required	15 775
Less: opening inventory	500
Units to be produced	15 275

(4)

Note: The production budget is expressed in quantities only.

ANNEXURE B:

MAC3701 OCT/NOV 2014 EXAMINATION:

Please note that lecturers are by no means required to supply students with suggested solutions to past examination papers. The Oct/Nov 2014 MAC3701 examination question paper has been put on myUnisa (available in both English and Afrikaans) as a courtesy for students to get an idea on how syllabus may be examined.

This is the suggested solution to the Oct/Nov 2014 MAC3701 examination.

Please note that this suggested solution does not necessarily contain all the possible alternative approaches to these questions. Please also note that this paper should not be seen as an indication of the topics that will be asked in the next examination.

It is in your own interest to attempt the questions as if in an exam setting and thereafter to work through the suggested solution in conjunction with the questions and your own answer.

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QUESTION 1

a) Traditional method
If the traditional absorption costing system was used and the production overhead was allocated based on the number of machine hours, calculate the overhead cost that would be apportioned to each product type.

Cost driver	Fit Steps	Fit Distance	Fit Calories	Total
Overhead cost	1,000,000	2,000,000	1,000,000	4,000,000

b) ABC method

Gross profit per product	Fit Steps	Fit Distance	Fit Calories	Total (column not required)
Sales	1,600,000	4,750,000	3,560,000	9,910,000
Less: Variable cost:				
Direct material (given)	668,500	800,950	780,000	2,249,450
Direct labour (given)	589,230	344,300	674,470	1,608,000
Marginal income before manufacturing overheads	342,270	3,604,750	2,105,530	6,052,550
Machining: Machine hours	377,500	755,000	377,500	1,510,000
Set up: Number of set-ups	140,000	280,000	140,000	560,000
Inspections: Number of inspections	300,000	360,000	240,000	900,000
Stores issues: Number of stores issues	195,000	39,000	156,000	390,000
Stores receiving: Number of deliveries	96,000	320,000	224,000	640,000
Gross profit	-766,230	1,850,750	968,030	2,052,550

Calculation: Number of activities per product type

Cost driver	Fit Steps	Fit Distance	Fit Calories	Total
Machine hours	20,000	40,000	20,000	80,000
Number of set ups	10	20	10	40
Number of inspections	50	60	40	150
Number of deliveries	15	50	35	100
Number of store issues	500	100	400	1,000

c) Using the traditional method, Fit Steps will have R1 000 000 allocated manufacturing overheads. Using the activity-based costing method to allocated manufacturing overheads, Fit Steps will have only R1 108 500 manufacturing overheads allocated to it.

- The traditional system relies on **arbitrary allocations**.

- The major distinguishing feature of ABC compared with traditional costing systems is that ABC systems assign costs to activity cost centres using **cause-and-effect allocation bases**. (using activities as cost-drivers)

- The reason for the difference is because the Fit Steps product type proportionally **makes more use of activities that drive the cost** in relation to the other product types and as a result of using an ABC costing system, more manufacturing overheads were assigned to this product type. (R1 108 500 ABC vs R1 000 000 Traditional)

    √√ (full marks for any two valid comments)

QUESTION 2:

PART A

    a. Economic order quantity (EOQ)

$$\sqrt{\frac{2 \times U \times C}{H+(P \times i)}}$$

$$\sqrt{\frac{2 \times 12\,000 \times R200}{R18 + (R120 \times 10\%)}}$$

$$\sqrt{\frac{R4\,800\,000}{R30}}$$

= 400 Cars

b. Reorder point   =   (Average rate of usage x lead time) + safety stock
                            =   (12 000 / 345) x 5 + 250
                            =   423,913   (2)
                            =   424 units
                                (also accept 425 units, due to rounding)

c. Should the special price be accepted:

Savings on purchase price ((12 000 x R120) - (12 000 X R100))	R 240 000	(1)
Inventory holding cost (R15 000 – R13 500)	(R 1 500)	(1)
Increase in import duties (R19 000 x 12)	(R228 000)	(1)
Savings on ordering cost ((12 000/ 400 EOQ) x R200) – (R200x12)))	R 3 600	(2)
Net savings	R 14 100	

Alternative

Purchase price	1 440 000	1 200 000
Inventory holding cost	13 500	15 000
Import duties		228 000
Ordering cost	6000	2 400

On the basis of the net savings involved, Toyz (Pty) Ltd should accept the price offered by the supplier from the Middle East.   Principle mark (1)

It should, however, consider the effect this may have on its established relationships it has with its local suppliers, among other things.   Principle mark (1)

PART B

a. Value of closing inventory
News printing paper
((R421 687 / 700 tons) X 100 tons))   =   R60 241
Card box making paper
((R578 313 / 800 tons) X 100 tons))   =   R72 289

Joint products costs		
Raw materials	R800 000	
Manufacturing labour	R200 000	
Manufacturing overheads	R300 000	
Insurance – administrative building	-	(not part of product costs)
Head office security officer salary	-	(Not part of product costs)
Depreciation – head office building	-	(Not part of product costs)
Administrative overheads	-	(Not part of product cost)
Proceeds from sale of pulp (200 X R1 500)	(R300 000)	
	R1 000 000	
		Maximum 4

Sales value

News printing paper (700 tons X R10 000)	=	R7 000 000	
Card box making paper (800 tons X R12 000)	=	R9 600 000	
	=	R16 600 000	

Joint costs allocation

News printing paper ((R7 000 000 / R16 600 000) X R1 000 000))   = R421 687
Card box making paper ((R9 600 000 / R16 600 000) X R1 000 000))   = R578 313

b. Should the company further process pulp?

Incremental income ((R2 000 – R1 500) X 200 tons))		=	R100 000
Incremental costs:		=	(R48 700)
- Raw materials	R20 000		
- Manufacturing labour	R25 000		
- Insurance	R 700		
- Machine rental	R 3 000		
Incremental monthly income		=	R51 300

The company should process pulp further√ as it will earn an incremental income of R51 300.

Alternative presentation

Do not process further	Process further	Difference
R1500 x 200 = R300 000	R2000 x 200 = R400 000	R500 x 200 = R100 000
	(R 20 000)	(R 20 000)
	(R 25 000)	(R 25 000)
	(R 700)	(R 700)
	(R 3 000)	(R 3 000)
R300 000	R 351 300	R 51 300

PART C:

a. Learning curve

$$\frac{\text{Cumulative average time per unit}}{\text{Previous cumulative average time per unit}} \quad X \quad \frac{100}{1}$$

$$= \quad \frac{5,76/2}{3} \quad x \frac{100}{1}$$

$$= \quad 96\%$$

b. Total number of hours to manufacture 14 laptops

Formula method = time for 1st unit x total number of units$^{(log\ learning\ curve/log\ 2)}$
= 3 x 16$^{(-0,0408/\ 0,\ 693147)}$
= 3 x 16$^{-0,\ 0589}$
= 3 x 0,8493
= 2,5480

Time for 16 laptops = 2,5480 x 16 = 40,7680

Time for the 14 laptops placed on order = 40,7679 – 5,76 = 35,01 hours

Note:
The logarithm function is indicated by (LN) on your calculator.
The index of learning (b) is calculated as a logarithm of the learning curve divided by a logarithm of 2.

OR Tabular method

Cumulative units	Doubling	Hours of cumulative average time per laptop	Total time (hours) for the number of laptops
1	-	3	3
2	1	2,88 (3 x 96%)	5,76
4	2	2,7648 (2,88 x 96%)	11,0592
8	3	2,6542 (2,7648 X 96%)	21,2337
16	4	2,5480 (2,6542 X 96%)	40,7686

Time for the 14 laptops placed on order = 40,7686 – 5,76 = 35,01 hours

OR
Time for the 14 laptops placed on order = 3(0,96)^4 x 16 = 40,7686 – 5,76 = 35,01 hours

Please take note that the final mark in the calculation of the 14 laptops is a principle mark
(for if the student subtracted the total of the first 2 from the total of the 16).

PART D:

(a) "the value of an independent marginal increase of a scarce resource, also known as the opportunity cost" √√

or:

the value of an additional unit of a scarce resource to the company √√
premium a company will be willing to pay above the normal price for one additional unit of a scarce resource √√
opportunity cost √√
the increase in contribution if one additional unit of a scarce resource is obtained √√

(b) Increase in contribution from Bargain-O (2 x R30)   R60

Decrease in contribution from Bargain-E (1 x R50)   (R50)

Increase in contribution (shadow price)   R10
Premium to be paid for additional kg of scarce resource   (R8)
Net increase in contribution   R2

The company should buy the additional kg of material as the shadow price exceeds the actual premium of R8 (or as there is a net increase in contribution if the extra kg is bought and used, or if they show a net increase of R2 in their calculations or if they show R10 > R8).

Alternative:
Contribution from the additional two Bargain-O's using more expensive resource
(2 x [R30 – R8/2])   R52
Lost contribution from one less Bargain-E   (R50)
Net increase in contribution   R2
The company should buy the additional kg of material as there is a net increase in contribution if the extra kg is bought and used (or if net increase of R2 is shown in calculations – see above).

Take note of the following alternative:

If a student calculates total contribution before another unit of scarce resource is obtained:
550 x 30 = 16 500
350 x 50 = 17 500
                34 000

Total contribution after another unit of scarce resource is obtained:
552 x 30 = 16 560
349 x 50 = 17 450
                34 010

Difference = R10 which earns a mark

QUESTION 3:

a) Direct material purchases budget:
16 000 units x 3,2 kg per unit   51 200

Material purchases budget
1st 30 000 units at R25 per kg   750 000
2nd 20 000 units at R23 per kg   460 000
1 200 units at R21 per kg   25 200
Total   1 235 200

b) Direct labour budget

Learning curve   =   Cumulative average time per unit
                              Previous cumulative time per unit

                     =   912
                          950

                     =   96%

	Total "batches"		Cumulative average time per batch	Total time
	1	4 000	950	950
1	2	8 000	912	1 824
2	4	16 000	875,52	3 502,08

Direct labour skilled
R450 per hour x **3 502,08 hours**   1 575 936

Direct labour unskilled
R30 per hour x 16 000 hours   480 000
                                                                       2 055 936

c) Amount of variable factory overheads

Variable factory overhead budget
3 502,08 hours x R16 per hour   56 033,28

d) i) TRUE → Depreciation will not be a line-item in a cash budget

   ii) TRUE → 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.

QUESTION 4:

a) R80 *or* the variable manufacturing overheads of the Alpha Division

b) R170 *or* the market selling price of the Alpha Division

c) Each manager will only consider the costs that are variable to them as the fixed costs are unavoidable. R90 >R80, thus, yes, the manager of Alpha will want to produce the components.

d) Each manager will only consider the costs that are variable to them as the fixed costs are unavoidable. R190 > R90 + R80 = R170, thus, yes, the manager of Beta will want to produce the product that he sells.

e) R170 *or* the market selling price of the Alpha Division

f) Residual income = controllable income – (cost of capital charge on the investment controllable by the divisional manager)
   Residual income = R1 550 000 – (12% x R5000 000)
   = R1 550 000 – R600 000 = R950 000

g) Alpha Division's manager should no longer produce the components because:
   It would be **unethical** to produce components that are harmful to children.
   Qualitative/Non-financial factors should be taken into account.
   Negative publicity and reputational damage is possible if this information becomes available.

QUESTION 5:

(a) (i) SALES MIX VARIANCE

(Actual sales volume – actual sales volume in budgeted proportions) x standard contribution   per bag

Product	Actual sales volume (bags)	Actual sales volume in budgeted proportions (bags)	Difference in volume (bags)	Standard contribution (R)	Sales margin mix variance (R)
	(1)	(2)	(3) = (1) – (2)	(4)	(3) x (4)
Handbag	900	960 ①	(60)	238,00③ (see below)	(14 280) (A)
Sporty bag	300	240 ②	60	350,50③ (see below)	21 030 (F)
	1 200	1 200		**Total**	**6 750 (F)**

Total budgeted sales volume = 1 000 + 250 = 1 250

① Actual sales volume in budgeted proportions (Handbag)
    = 1 200 x 1 000 / 1 250
    = 960 handbags

② Actual sales volume in budgeted proportions (Sporty bag)
    = 1 200 x 250 / 1 250
    = 240 sporty bags

③ **Standard contribution**

	Handbag Total	Per unit (R)	**Sporty bag** Total	Per unit (R)
Standard selling price	430 000	430	140 000	560
Less: Std variable costs per bag	(192 000)	(192)	(52 375)	(209,50)
Std variable production costs per unit	180 000	180*	50 000	200*
Std variable selling costs per unit (12 000 / 1 000 = R12 per handbag) (2 375 / 250 = R9,50 per sporty bag)	12 000	12	2 375	9,50
Standard contribution per bag	238 000 ÷ 10 000 units	238	87 625 ÷ 250 units	350,50
	= R238 per unit		= R350,50 per unit	

Available marks: 9
Maximum marks: 6

-->Student could show workings in **total** or **per unit** to earn the marks for calculation of standard contribution.

(a) (ii) SALES MARGIN VOLUME VARIANCE

(Actual sales volume – budgeted sales volume) x standard contribution per bag

Product	Actual sales volume (bags)	Budgeted sales volume (bags)	Difference in volume (bags)	Standard contribution (R)	Sales margin volume variance (R)
	(1)	(2)	(3) = (1) – (2)	(4)	(3) x (4)
Handbag	900	1 000	(100)	238,00	(23 800) (A)
Sporty bag	300	250	50	350,50	17 525 (F)
	1 200	1 250		**Totaal**	**6 275 (A)**

Available marks: 6
Maximum marks: 4

(a) (iii) MATERIAL PURCHASE PRICE VARIANCE

(SP – AP) x AQ purchased

Material	Standard price (per metre)	Actual price (per metre)	Difference in price (per metre)	Actual quantity purchased (metres)	Material purchase price variance (R)
	(1)	(2)	(3) = (1) – (2)	(4)	(3) x (4)
Handbag	36	32	4	51 840/32 = 1 620	6 480 (F)
Sporty bag	36	32	4	18 240/32 = 570	2 280 (F)
				Total	8 760 (F)

Available marks: 3
Maximum marks: 2

Alternative 1:
Handbags (36 – 32) x 1 620 = R6 480 (F)
Sporty bags (36 – 32) x 570 = R2 280 (F)
Total = 6 840 (F) + 2 280 (F) = R8 760 (F)

Alternative 2:
Or simply (36 – 32) x (1 620 + 570) = 4 x 2 190 = R8 760 (F)

Alternative 3:
Actual cost – (AQ purchased x SP) or [AP x AQ] - (AQ purchased x SP)

Handbags 51 840 – (1 620 x 36) = 51 840 – 58 320 = R6 480 (F)
Sporty bags 18 240 – (570 x 36) = 18 240 – 20 520 = R2 280 (F)
Total = 6 840 (F) + 2 280 (F) = R8 760 (F)

Or simply (51 840 + 18 240) - (1 620 + 570) x 36 = 70 080 – 78 840 = R8 760 (F)

(b) ABSORPTION COSTING vs DIRECT COSTING APPROACH:

Available marks: 13
Maximum marks: 8

Summary:
- √ Communication mark if attempted this question
- √√ Formula changes (or standard profit needs to be calculated)
- √ Bonus for std profit = Handbag R186 and
- √ Bonus for std profit = Sporty bag B R298,50
- √√ Fixed manufacturing overhead rate needs to be calculated or R52
- √√ Stating/showing in calc that ASV and ASV in budget proportion remains the same
- √√ Total variance stays constant because a **company-wide** rate **per unit** is used for allocating fixed manufacturing costs
- √√ Per product amounts decrease
  to Handbags R11 160 (A) and Sporty Bags R17 910 (F)

The formula would change to the following:
   (Actual sales volume – actual sales volume in budgeted proportions)
    X standard **profit** margin per bag
I.e. standard **profit** margin per bag instead of standard contribution per bag has to be calculated and used. √√ for stating that formula changes or that std. profit per bag is now required

Standard profit per bag:

	R	R
Standard contribution per bag (the same as previously)	238,00	350,50
Less: Standard **fixed production** overhead cost per bag	(52,00)	(52,00)
Standard profit margin per bag	186 √ bonus if correct	298,50 √ bonus if correct

To calculate **the standard fixed production overhead cost** per unit we have to calculate the fixed production overhead recovery rate per unit as the budgeted fixed production overheads divided by the budgeted production (bags):
65 000 / (1 000 + 250)
= 65 000 / 1 250
= R52/bag √√ for stating that std fixed production overhead cost should be taken into account or for calculating it

(**Actual sales volume – actual sales volume in budgeted proportions) will remain the same**
as before but this will be multiplied by R186 (handbags) and R298,50 (sporty bags) instead of the contribution per respective bag: √√ for stating/showing in calc that ASV and ASV in budget proportion remains the same

Product	Difference in volume (bags)	Standard profit (R)	Sales margin volume variance (R)
	(1): (from 1(i))	(2)	(1) x (2)
Handbag	(60)	186,00(above)	(11 160) (A)
Sporty bag	60	298,50(above)	17 910 (F)
		Total	**6 750 (F)**

If Blue Bags (Pty) Ltd uses an absorption costing system, they will arrive at the same total sales margin mix variance √√ than with the direct costing system (R6 750 (F)) as a **company-wide** rate **per unit** is used for allocating fixed manufacturing costs.

However, the individual amounts for the two products that contribute to the sales margin mix variance will be less than before √√ as they are now based on standard profit, which is less than standard contribution due to the subtraction of fixed manufacturing overheads based on an overhead absorption rate.

(Previously the amount pertaining to handbags was R14 280 (A) and now it is R11 160 (A) – i.e. R3 120 less – and the variance amount pertaining to sporty bags was R21 030 (F) and now it is R17 910 (F) – i.e. also R3 120 less.)

5 (c)(i) **TOTAL BUDGETED BREAKEVEN SALES VALUE**
Based on the **budgeted** figures:

Sales mix (budgeted) = 1000 : 250
                     = 4   :   1

Contribution in sales mix: **(4 x R238) + (1 x R350,50) = R952 +350,50 = R1 302,50** $\sqrt{}$**principle if x std contr**

Breakeven units   = Total fixed cost
                         Contribution per unit in mix ratio

                         = (R13 500 x 6) + R65 000
                                R1 302,50

                         = R81 000 + R65 000
                              R1 302,50

                         = R146 000/R1 302,50

                         = 113 x 5 units per sales mix

                         = 565 units in total

	Breakeven Q	Breakeven Value
Handbags	**= 4/5 x 565 = 452 units**	**x R430 = R194 360**
Sporty bags	**= 1/5 x 565 = 113 units**	**x R560 = R 63 280**
		Total = R257 640

ALTERNATIVE

Sales mix (budgeted) = 1000 : 250

Contribution in sales mix: **(1 000 x R238) + (250 x R350,50) = R238 000 + R87 625 = R325 625**
                                                                                  $\sqrt{}$**principle if x std contr**

Breakeven VALUE   = Total fixed cost
                         Contribution ratio

                         =(R13 500 x 6) + R65 000
                              R325 625/R570 000 ①

                         = R81 000 + R65 000
                              0.571 (rounded)

                         = R146 000/0.571

                         = R255 692 (rounded up)

Total budgeted sales
= 1 000(430) +
250(560)

= 430 000 + 140 000
= R570 000

5 (c) (ii) Total budgeted breakeven quantity of the company for the six month-period based on the following assumption: the sporty bag product line was discontinued before 1 April 2014 and the standard material purchase price per meter was adjusted downward by 10%.   (3)

BREAKEVEN SALES QUANTITY

Available marks:	5
Maximum marks:	3

= Fixed costs / contribution per unit
= [(13 500x6) + 65 000] / 243,40
= R146 000 / R243,40
= 599,84… units
= 600 HANDBAGS (rounded UP) $\sqrt{}$ principle mark for rounding up

Calculation for new standard contribution:

	Handbag R
Standard selling price	430,00
Less: Std variable costs per bag	(186,60)
Std variable production costs per unit (180 – 54/36 x 36 x 10%)	174,60
Std variable selling costs per unit	12
Standard contribution per bag	243,40

Alternative:
New standard contribution per bag = 238,00 + (10% x R54) = R243,40

Breakeven sales quantity = R146 000/ R243,40 = 600 $^{rounded up}$

References:
Drury, C. 2012. *Management and cost accounting.* 8th edition. Andover: Cengage Learning.
Drury, C. 2015. *Management and cost accounting.* 9th edition. Andover: Cengage Learning.

It is in your own interest to go to the MyUnisa website on a regular basis and to be on the lookout for any new announcements.