

The Institute of Finance Management
Department Accounting and Finance
Management Accounting
BAIT 3 & BACC 3
Tutorial Questions
Activity Based Costing (ABC) System
Instructor Dr. Zawadi Ally

QUESTION 1

ABC Company is proposing the introduction of an activity Based Costing (ABC) system as a basis for much of its management accounting information. As a recently graduated as CPA holder and appointed by the company as management and cost accountant, one of your duties is the successfully implementation of the proposed new costing system.

REQUIRED

- (a) Briefly describe how ABC is different from a traditional absorption approach and explain why it was developed
- (b) Describe the likely stages involved in the design and operation of an ABC system
- (c) Discuss the advantages and limitations on this approach.

QUESTION 2

Describe four broad categories of activities identified in an activity-based costing system

QUESTION 3

A full absorption costing system would involve the assignment of both variable and fixed overhead costs to products. A traditional full absorption costing system typically uses a single volume related allocated base (or cost driver) to assign overheads to products. An activity based costing (ABC) system would use multiple allocation bases (or cost drivers), taking account different categories of activities and related overhead costs such as unit, batch, product sustaining and facility sustaining.

REQUIRED

- (a) Describe the likely stages involved in the designing and operation of an ABC system
- (b) Explain and discuss volume related allocation bases(or cost driver), giving example of one within a traditional costing system. Contrast this with the multiple allocation bases (or cost drivers) of an ABC system.
- (c) Briefly elaborate on the different categories of activities and related overheads costs such as unit, batch, product sustaining and facility sustaining, which may be used in an ABC system.

QUESTION 4

Bunge Products Limited is a leading manufacturer of silver picture frames. The company uses a traditional costing system to allocate production overheads to products using machine hours. The newly appointed financial controller believes that activity based costing can provide a better allocation of production overheads to products than the current system does. The following total production overheads for the last period were recorded by the cost accounting system:

	Shs
Utility costs related to machine hours	189,000
Production set-up costs	120,000
Cost of ordering materials	18,000
Cost of handling materials	33,000

Details of the three product models and relevant information for the last period are as follows:

	Model 1	Model 2	Model 3
Number of production runs	17	25	18
Number of material orders	20	30	40
Number of material requisitions	30	100	70
Units produced	1,000	2,000	2,500
Machine hours per unit	1	1.5	2
Direct labour hours per unit (Shs60 per hour)	0.5 hour	1 hour	2 hours
Direct materials per unit	Shs10	Shs12	Shs15

Required:

- Calculate the unit production cost of each of the three products using: (i) the traditional absorption costing, and (ii) the activity based costing approach
- Comment on your calculations in part (a) above and explain why the activity based costing approach is superior to traditional absorption costing.

QUESTION 5

BM Product Ltd manufactures two types of bean bags – Standard and Deluxe. Both beanbags are produced on the same equipment and use similar processes. The following budgeted data has been obtained for the year ended 31 December 2014

Product	Standard	Deluxe
Production (units)	25,000	2,500
Number of purchase order	400	200
Number of set up	150	100
Resources required per unit		
Direct material (Shs)	25.00	62.50
Direct labour (hours)	10	10

Machine time (hours)	5	5
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Budgeted production overheads for the year have been analyzed as follows

	Shs
Volume related overheads	275,000
Purchases related overheads	300,000
Set- up related overheads	525,000

The budgeted wage rate is Shs. 20.00 per hour

The company's present system is to absorb overheads by product units using rates per labour.

However, the company is considering implementing a system of activity-based costing. An activity-based investigation revealed that the cost drivers for the overhead costs are as follows:

Volume related overheads	Machine hours
Purchases related overheads	Number of purchase orders
Set- up related overheads	Number of set-ups

REQUIRED

Calculate the unit costs for each type of beanbag using

- The current absorption costing system
- The proposed ABC system
- Compare your results in (i) and (ii) above and briefly comment on your findings

QUESTION 6

Having attended a CPA review class on Activity Based Costing (ABC), you decide to experiment by applying the principles of ABC to the four products currently made and sold by your company. Details of the four products and relevant information are given below for one period

Product	A	B	C	D
Output in units	120	100	80	120
Cost per units in (Shs 000)				
Direct material	40	50	30	60
Direct labour	28	21	14	21
Machine hours (per unit)	4	3	2	3

The four products are similar and are usually produced in production runs of 20 units and sold in batches of 10 units.

The production overhead for the period has been analysed as follows:

	Shs 000
Machine department costs (rent, business rates, depreciation and supervision)	10,430
Set- up costs	5,250
Store receiving	3,600
Inspection/quality control	2,100
Materials handling and dispatch	4,620

You have ascertained that cost drivers to be used are as listed below for the overhead costs shown:

Cost	Cost Driver
Set up costs	Number of production runs
Stores receiving control	Requisitions raised
Inspection/Quality control	Number of production runs
Materials handling and dispatch	Orders executed

The number of requisitions raised on the store was 20 for each product and the number of orders executed was 42, each order being for a batch of 10 of a product.

REQUIRED

- Calculate the total costs for each product if all overhead costs are absorbed on a machine hour basis.
- Calculate the total costs for each product, using ABC
- Calculate and list the unit product costs from your figure in (a) and (b) above, to show the differences: and comment briefly on any conclusions which may be down which could have pricing and profit implications

QUESTION 7

ABC Company manufactures two products, Product C and Product D. The company estimated it would incur Shs130,890 in manufacturing overhead costs during the current period. Overhead currently is assigned to the products on the basis of direct labor hours. Data concerning the current period's operations appear below:

	<u>Product C</u>	<u>Product D</u>
Estimated volume	400 units	1,200 units
Direct labor hours per unit	0.70 hour	1.20 hours
Direct material cost per unit	Shs10.70	Shs16.70
Direct labor cost per unit	Shs11.20	Shs19.20

Management is considering using activity-based costing to apply manufacturing overhead cost to products for external financial reports. The activity-based costing system would have the following three activity cost pools:

<u>Activity Cost Pool</u>	<u>Activity Measure</u>	<u>Estimated Overhead Cost</u>
Machine setups	Number of setups	Shs 13,570
Purchase Orders	Number of purchase orders	91,520
General Factory	Direct labor hours	25,800

<u>Activity Measure</u>	<u>Product C</u>	<u>Product D</u>	<u>Total</u>
Number of setups	100	130	230
Number of purchase orders	810	1,270	2,080
Number of direct labor hours	280	1,440	1,720

REQUIRED:

- Compute the predetermined overhead rate under the current method.
- Determine the unit product cost of each product.
- Determine the activity rate (i.e. predetermined overhead rate) for each cost pool.
- Compute the total amount of manufacturing overhead cost that would be applied to each product using the activity-based costing system. After these totals have been computed, determine the amount of manufacturing overhead cost per unit of each product.
- Compute the unit product cost of each product.
- Compute the overhead applied to work-in-process using both traditional costing and ABC for a job with the following actual activity

<u>Activity Measure</u>	<u>Job</u>
Number of setups	10
Number of purchase orders	40
Number of direct labor hours	60

QUESTION 8

Doto Ltd manufacture three products A, B and C. Data for the period just ended is as follows;

Product	A	B	C
Output in units	20,000	25,000	2,000
	Shs/unit	Shs/unit	Shs/unit
Direct material cost	5,000	10,000	10,000
Total production overheads	Shs 190m		

Information for overhead absorption on a labour hour's basis

	A	B	C
Labour hours per unit	2	1	1
Labour is paid at the rate of Shs 5,000 per hour			

Information for activity based costing

Cost data

	Shs '000'
Machining	55,000
Quality control & Set-up costs	90,000
Receiving	30,000
Packing	15,000
	190,000

Cost driver data	A	B	C
Machine hours/unit	2	2	2
No. of production runs	10	13	2
No. of components receipts	10	10	2
No. of customer orders	20	20	20

REQUIRED

Calculate the total cost per unit for each product using

- Traditional absorption costing assuming production overheads are absorbed on the basis of labour hours
- Activity based costing

QUESTION 9

The following budgeted information relates to Bunge plc for the following period.

	Products		
	XA	XB	XC
Sales and production (units)	50,000	40,000	30,000
	Shs	Shs	Shs
Selling price (per unit)	45	95	73
Prime cost (per unit)	32	84	65
	Hours	Hours	Hours
Machine department (machine hrs per unit)	2	5	4
Assembly department (direct hrs per unit)	7	3	2

Overheads allocated and apportioned to production departments (including services cost centre costs to be recovered in product costs as follows

- Machine department at Shs 1.20 per machine hour
- Assembly department at Shs 0.825 per direct labour hour

You ascertain that the above overheads could be re-analysed into 'cost pools' as follows.

Cost pool	Shs	Cost driver	Qty for the period
Machining service	357,000	Machine hours	420,000
Assembly services	318,000	Direct labour hours	530,000
Set-up costs	26,000	Set-ups	520
Order processing	156,000	Customer orders	32,000
Purchasing	<u>84,000</u>	Suppliers	11,200
	<u>941,000</u>		

You have also been provided with the following estimates for the period

	Products		
	XA	XB	XC
Numbers of set-ups	120	200	200
Customers orders	8,000	8,000	16,000
Suppliers' orders	3,000	4,000	4,200

REQUIRED

- Prepare and present statements using
 - Convention absorption costing and
 - Activity based costing
- Comment on why activity-based costing is considered to present a fair valuation of the product cost per unit

QUESTION 10

BM Company has three product lines B1, B2 and B3. Since its creation the company has been using a single direct labour cost percent to assign overhead costs to products.

Despite B3, a relatively new product line, attracting additional business, increasing overhead costs and a loss of market share, particularly for B2, a major product, have convinced the management that the costing system needs some development. A team, led by the management accountant, was established to develop an improved system of costing based on activities. The team spent several weeks collecting data (see tables) for the different activities and products. For the accounting period in question, given in the tables below, is data on Bunge's three product lines and overheads costs:

	B1	B2	B3
Production volume (units)	7,500	12,500	4,000
Direct labour cost per unit (Shs)	4.00	8.00	6.40
Material cost per unit (Shs)	18.00	25.00	16.00
Selling price per unit (Shs)	47.00	80.00	68.00
Material movements (in total)	4	25	50
Machine hours per unit	0.5	0.5	0.2
Set ups (in total)	1	5	10
Proportion of engineering work	30%	20%	50%
Orders packed (in total)	1	7	22

Activities	Overhead Cost (Shs)
Material receiving and handling	150,000
Machine maintenance and depreciation	390,000
Set up labour	18,000
Engineering	100,000
Packing	<u>60,000</u>
Total	<u>718,000</u>

REQUIRED

- Calculate the overhead rate and the product unit costs under existing costing system
- Identify for each overhead activity, an appropriate cost driver from the information supplied and then calculate the product unit costs using a system that assigns overheads on the basis of the use of activities
- Comment on the results of the two costing system in (a) and (b) above with particular reference to the usefulness of ABC for pricing and target costing purposes

QUESTION 11

The Bondeni Co produces three products, XA, XB and XC, all made from the same material. Until now, it has used traditional absorption costing to allocate overheads to its products. The company is now considering an activity-based costing system in the hope that it will improve profitability. Information for the three products for the last year is as follows:

	A	B	C
Production and sales volumes (units)	15,000	12,000	18,000
Selling price per unit	Shs7.50	Shs12	Shs13
Raw material usage (kg) per unit	2	3	4
Direct labour hours per unit	0.1	0.15	0.2
Machine hours per unit	0.5	0.7	0.9
Number of production runs per annum	16	12	8
Number of purchase orders per annum	24	28	42
Number of deliveries to retailers per annum	48	30	62

The price for raw materials remained constant throughout the year at Shs1.20 per kg. Similarly, the direct labour cost for the whole workforce was Shs14.80 per hour. The annual overhead costs were as follows:

	Shs
Machine set up costs	26,550
Machine running costs	66,400
Procurement costs	48,000
Delivery costs	54,320

Required:

- Calculate the full cost per unit for products XA, XB and XC under traditional absorption costing, using direct labour hours as the basis for apportionment.
- Calculate the full cost for each product using activity-based costing

QUESTION 12

ZA Products Limited is a leading manufacturer of silver picture frames. The company uses a traditional costing system to allocate production overheads to products using machine hours. The newly appointed financial controller believes that activity-based costing can provide a better allocation of production overheads to products than the current system does. The following total production overheads for the last period were recorded by the cost accounting system:

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Cost of ordering materials	18,000
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Details of the three product models and relevant information for the last period are as follows:

	Model 1	Model 2	Model 3
Number of productions runs	17	25	18
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Number of material requisitions	30	100	70
Units produced	1,000	2,000	2,500
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Direct labour hours per unit (Shs60 per hour)	0.5-hour	1 hour	2 hours
Direct materials per unit	Shs10	Shs12	Shs15

Required:

- Calculate the unit production cost of each of the three products using: (i) the traditional absorption costing, and (ii) the activity-based costing approach
- Comment on your calculations in part (a) above and explain why the activity-based costing approach is superior to traditional absorption costing